

## SUBJECT TEACHING GUIDE

### G640 - Electrical Energy Generating Plants

#### Degree in Mining Resources Engineering

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Degree in Mining Resources Engineering			Type and Year	Optional. Year 3
Faculty					
Discipline	Optional Subjects: Mine Exploitation Module: Optional Training				
Course unit title and code	G640 - Electrical Energy Generating Plants				
Number of ECTS credits allocated	6	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	JUAN CARCEDO HAYA				
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Other lecturers	JORGE TOMAS CUELI LOPEZ				

### 3.1 LEARNING OUTCOMES

- Knowledge of the basic aspects to consider in conventional electric power plants.
- Knowledge of the operation and fundamental components of hydroelectric, thermal, combined cycle and cogeneration power plants

### 4. OBJECTIVES

- Introduction to the student in the basic concepts associated with the generation of electric power in conventional plants.

6. COURSE ORGANIZATION	
CONTENTS	
1	<b>ELECTRICAL POWER SYSTEMS</b> General aspects. Historical background. Components and statistics. Operation. Regulations.
2	<b>GENERATION OF ELECTRICAL ENERGY</b> Primary energy sources. Production technologies. Economic and operational aspects.
3	<b>HYDROELECTRIC POWER PLANTS</b> Operation of a hydroelectric power plant. Basic aspects of a hydroelectric power plant. Classification of hydroelectric power plants. Hydroelectric pumping stations. Elements of hydroelectric power plants. Regulation and control.
4	<b>THERMOELECTRIC POWER PLANTS</b> Operation of a thermal power plant. Steam power plants. Gas power plants. Combined cycle power plants. Combined heat and power plants. Problems associated with thermal power plants.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
FINAL EXAM	Written exam	Yes	Yes	60,00
PERIODIC ASSESSMENTS (NON ELIMINATING)	Written exam	No	Yes	30,00
PROGRAMMING PRACTICES	Work	No	No	10,00
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
"Centrales eléctricas" (tomo I). A.L. Orille "Mecánica de fluidos incompresibles y máquinas hidráulicas". J. Agüera (*) "Mecánica de fluidos y máquinas hidráulicas" C. Mataix "Turbomáquinas hidráulicas". C. Mataix "Centrales hidroeléctricas". G. Zoppetti "Termodinámica lógica y motores térmicos". J. Agüera (*) "Termodinámica técnica y máquinas térmicas". C. Mataix "Turbomáquinas térmicas". C. Mataix (*) Acceso abierto en <a href="http://www.uco.es/termodinamica/">http://www.uco.es/termodinamica/</a>