

## SUBJECT TEACHING GUIDE

G621 - Electrical Machines

Degree in Mining Resources Engineering

Academic year 2015-2016

1. IDENTIFYING DATA			
Degree	Degree in Mining Resources Engineering	Type and Year	Compulsory. Year 2
Faculty			
Discipline	Second Year Subjects Fundamentals of Electrical Technology Module: Training in Common with the Mining Branch		
Course unit title and code	G621 - Electrical Machines		
Number of ECTS credits allocated	6	Term	Semester based (2)
Web			
Language of instruction	Spanish	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA		
Name of lecturer	FERNANDO DELGADO SAN ROMAN		
E-mail	fernando.delgado@unican.es		
Office	E.T.S.I. Industriales y Telecomunicación. Planta: - 2. DESPACHO - BECARIOS (S2026)		
Other lecturers	PRIMO VEJO GALLO CRISTIAN OLMO SALAS		

### 3.1 LEARNING OUTCOMES

- The student will learn the different parts of the electrical machines according to different criteria: excitation types, types of energy conversion, etc.
- The student will learn how to design and to calculate the equivalent electric circuit of an electrical machine.
- The student will learn how to regulate the electrical machines (speed, torque, etc) in order to adapt them to any production process.
- The student will learn how to regulate the electrical machines in order to get savings and to increase their energy efficiency.

#### 4. OBJECTIVES

- Comprehension of the constitution of the static and rotating electrical machines and their operating principles.
- To learn the analysis techniques of electrical machines.
- To know how to maneuver and regulate the electrical machines.
- To know the different drives (electrical drives and based on power electronics) that allow the electrical machines regulation.

#### 6. COURSE ORGANIZATION

CONTENTS	
1	SECTION I. Introduction to electrical machines Laboratory practice.
2	SECTION II. Transformers Laboratory practice
3	SECTION III. Power electronics systems. Laboratory practice.
4	SECTION IV. Asynchronous machines Laboratory practice
5	SECTION V. Synchronous machines Laboratory practice

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Theoretical&practical exam	Written exam	Yes	Yes	60,00
Laboratory exam	Laboratory evaluation	Yes	Yes	30,00
Continuous assessment of theoretical&practical works	Work	No	No	10,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
<ul style="list-style-type: none"> <li>- The grade of the laboratory practices exam and the grade of the continuous assessment will be maintained until the september convocatory.</li> <li>- The final grade will be calculated by means of the sum of the partial grades of the Theoretical &amp; practical exam, of the laboratory practices exam and of the continuous exam.</li> <li>- The final grade of the students that don't pass the subject will be calculated by means of the laboratory practices exam and of the continuous exam.</li> </ul>				
<b>Observations for part-time students</b>				
The assessment of the part-time students will be carried out according the Assessment Regulation of the UC				

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

#### BIBLIOGRAFÍA

- \* FRAILE MORA, J. "Máquinas Eléctricas". Ed. McGraw-Hill. Madrid. Teoría y Problemas
- \* GURRUTXAGA, J. A. "Electrotecnia básica para ingenieros". Servicio de Publicaciones de la E.T.S.I. de Caminos, C. y P. de Santander.
- \* RAS OLIVA, E. "Transformadores de potencia, medida y protección". Ed. Marcombo. Barcelona.
- \* CORTES CHERTA, M. "Curso moderno de máquinas eléctricas rotativas". Tomos 1 y 3. Editores Técnicos Asociados. Barcelona.