SUBJECT TEACHING GUIDE

G633 - Mining Engineering I

Degree in Mining Resources Engineering

Academic year 2020-2021

1. IDENTIFYING DATA					
Degree	Degree in Mining Resources Engineering			Type and Year	Compulsory. Year 3
Faculty					
Discipline	Subject Area: Technology of Mine Exploitation Module: Training in Exploitation of Mines				
Course unit title and code	G633 - Mining Engineering I				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. TRANSPORTES Y TECNOLOGIA DE PROYECTOS Y PROCESOS
Name of lecturer	RUBEN PEREZ ALVAREZ
E-mail	ruben.perez@unican.es
Office	E.P. de Ingeniería de Minas y Energía. Planta: + 2. DESPACHO (228)
Other lecturers	NOEMI BARRAL RAMON

3.1 LEARNING OUTCOMES

- Once the subject has been passed, the student will know the techniques applied in drilling and blasting procedures, being these understood as ways to extract mineral resources and to develop underground structures. The student will know the constrictions that can condition them, which are associated to different aspects such as geotechnics , geometry, design, Law or environment, and the requirements related to the use, employ and distribution of explosives.

4. OBJECTIVES

The main objectives of this subjects are listed next:
Acquisition of knowledge about all the mining techniques which are applied in conventional procedures of rock removal, both in open-pit and underground sites. These techniques will be understood as a way to develop underground structures.
The student must also know the different techniques applied for drilling.
The subject must provide specific training about the design and calculation of blasting procedures, the use and destruction of explosives. Special attention will be paid to the aspects that can condition the blasting (geotechnical, geometric, design, legal and environmental issues), and non-desired effects (projections, vibrations and aerial wave).

6. COURSE ORGANIZATION

	CONTENTS
1	DRILLING METHODS.- Roto-percussive drilling. Rotary drilling. Special methods. Rotary drilling with crown. Oil or water wells drilling.
2	EXPLOSIVES.- Characteristics of explosives. Types and application. Firing systems. Non-desired effects of blasting (vibrations, projections and aerial waves). Destruction of explosives. Specific laws. Processes of manufacturing of explosives and pyrotechnics.
3	WORKS OF ROCK BREAKAGE AND PREPARATION BY MEANS OF DRILLING AND BLASTING.- Calculation of open-pit blasting Calculation of underground blasting. Contour blasting. Other types.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Teamwork Essay	Work	No	Yes	10,00
Tests (Drilling)	Written exam	No	Yes	20,00
Tests (Blasting)	Written exam	No	Yes	10,00
Final Exam	Written exam	Yes	Yes	60,00
TOTAL				100,00

Observations

The final exam will be divided into the two main parts belonging to Drilling (Chapter I) and Blasting (Chapters II and III). The individual percentage of each one of these two parts will be 30% of the total score. It is necessary to pass both individual parts (getting a minimum score of 4,5/10 in each) to get through the whole subject. If these requirements are not satisfied, the final score will be calculated as the weighted average of each item of evaluation, until a maximum of 4.9. Any passed item will be kept for the extraordinary evaluation.

The tests and the final exam will be held on-site. However, if Sanitary and Educational Authorities suspended in-class activities, they would be held through Moodle, and monitored with Skype Business.

Observations for part-time students

Part-time students will be evaluated following the considerations established in the Normative of the University of Cantabria. The students will be given the chance to develop the teamwork essay as an individual one, and to take the tests on the same date that the final exam.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Manual de perforación y voladura de rocas. Autores: Carlos López Jimeno, Emilio López Jimeno, Pilar García Bermúdez. E.T.S.I.M. Madrid, U.P.M., 2003.
Procedimiento de sondeos. Autor: Puy Huarte, J.
Curso de tecnología de explosivos. Autor: Sanchidrian, J.A. y Muñiz E. Editorial Fundación Gómez Pardo.

Apuntes proporcionados por los profesores.