

SUBJECT TEACHING GUIDE

1140 - Exploitation Technology of mining resources

Master's Degree in mining engineering

Academic year 2023-2024

| 1. IDENTIFYING DATA | | | | | |
|----------------------------------|--|------------------|--------------------|------------------|--------------------|
| Degree | Master's Degree in mining engineering | | | Type and Year | Compulsory. Year 1 |
| Faculty | School of Mines and Energy Engineering | | | | |
| Discipline | MINING | | | | |
| Course unit title and code | 1140 - Exploitation Technology of mining resources | | | | |
| Number of ECTS credits allocated | 4,5 | Term | Semester based (2) | | |
| Web | | | | | |
| Language of instruction | Spanish | English Friendly | Yes | Mode of delivery | Face-to-face |

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|------------------|--|--|--|--|--|
| Department | DPTO. TRANSPORTES Y TECNOLOGIA DE PROYECTOS Y PROCESOS | | | | |
| Name of lecturer | RUBEN PEREZ ALVAREZ | | | | |
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| Other lecturers | | | | | |

3.1 LEARNING OUTCOMES

- Once the course has been passed, students will dominate the most common techniques applied in the field of the exploitation of resources.

4. OBJECTIVES

The main aims of this subject are listed next: calculate and design the right support of a mining work, adjust the ventilation of a mining work to the specific needs of each operation, design and calculate the parameters required for the removal of water mine, located and designed in the most objective point of view from a technical and environmental heaps and raft fine necessary in a mining exploitation, Knowledge for the essential elements of the electrical system and its risks and know the techniques of extraction and more suitable movement of land.

6. COURSE ORGANIZATION

CONTENTS

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| 1 | <p>TOPIC 1: SUPPORT IN MINING Support. Advantages and disadvantages of the use of steel versus wood. Description and functioning of rigid and articulated frames. Description and operation of the Sliding pictures. Definition of the phenomenon of convergence. Convergence galleries accompanying the pit. Bolts: Sustaining with bolts. Working concept of bolts. Anchor blocks, laminated land and subjected to shear displacements. System adhesively anchor. Friction anchoring system. Bolt type selection Bolting parameters. Curves load - deformation of individual bolts. Concrete projected. Advantages and disadvantages of the use of concrete. Mortars and concretes projected. Concrete components and dosages. Characteristic parameters concrete. Description gunning wet and dry methods.</p> <p>TOPIC 2: MINE VENTILATION Ventilation: Objectives ventilation. Atmosphere at the mine. Firedamp. Emanations of firedamp and dilution. The dust in the mine. Dilution of dust. A conduit resistance. Calculation equivalent resistance. Calculating ventilation networks. Characteristic curve of a mine. Main Fans: Centrifugal and helical. Characteristic curves of the fans and coupling. Secondary ventilation blower suction and mixed. Secondary ventilation depending on the starting method.</p> |
| 2 | <p>TOPIC 3: MINE DRAINAGE Underground drain. The water in the mine. Centrifugal and drive. A power centrifugal pump. Pump characteristics curves. Determination of manometric height. Situation and organization of the pump room of a well. Selection of dewatering pumps. Underground drain. Drainage of mining operations. Calculation and flows avenues. Calculation of channels, ditches and settling ponds.</p> <p>TOPIC 4: HEAP Generating heaps and residues tailings. Construction of heap. Stability analysis of heaps. Environmental impact of the heaps. Selection the site of a heap. General design criteria for raft ponds: transport and disposal. The dam and the stability of the dam. The water in the dam.</p> |
| 3 | <p>TOPIC 5: ELECTRICITY The electricity in the mine. Risks of electricity in mining. Preventive and protective measures. Ways and degrees of protection. Electrical installation: main elements, technical instructions of application, ATEX regulations, calculation an underground electrical grid.</p> <p>TOPIC 6: TILLAGE Tillage of mineral and energy resources. Techniques applied in the extraction of rocks industrial and ornamental. Earthworks. Joints. Planning, dimensioning, performance and efficiency machining extraction techniques and not machining extraction techniques. Mining through drilling. Leach mining. Geothermal.</p> |

7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|---|--------------|-------------|-----------|--------|
| Final exam | Written exam | Yes | Yes | 60,00 |
| Individual work | Work | No | Yes | 20,00 |
| Group work | Work | No | Yes | 10,00 |
| Resolution of practical exercises | Others | No | Yes | 10,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| <p>In order to pass, the student will be required to obtain a minimum score of 4,5/10 in the Final Exam of Contents, and an average score of 5/10 in the whole subject. If the minimum requirement of the final exam is not fulfilled, the final score will be calculated according to the weighted average of the different criteria, until a maximum of 4.9. Any passed item of the continuous evaluation will be kept for the extraordinary exam.</p> <p>The final exam will be held on-site. However, if Health and Educational Authorities suspended in-class activities, it will be developed through Moodle, and monitored with Teams.</p> | | | | |
| Observations for part-time students | | | | |
| <p>Part-time students will be evaluated according to the Normative of University of Cantabria. Part-time students will be evaluated following the Normative of University of Cantabria. In addition to the requirement of passing the Final Exam of Contents, and given the characteristics of the activities proposed for the continuous evaluation, part time students will be subject to them as the rest of students.</p> | | | | |

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Manual de Ventilación de Minas. Vicente Luque Cabal. AITEMIN
 El agua en la minería y obras subterráneas. Consejo Superior de Ingenieros de Minas.
 Fundamentos de Laboreo de Minas. Fernando Pla Ortíz. Fundación Gómez Pardo.
 Curso de Laboreo de Minas. L. Cuadra. Fundación Gómez Pardo.
 Manual de Evaluación y Diseño de Explotaciones MIneras. M. Bustillo Revuelta y Carlos López Jimeno.
 Apuntes básicos de la asignatura. Proporcionados por el profesor.