# SUBJECT TEACHING GUIDE

## G629 - Environmental Technology in Mining

## Degree in Mining Resources Engineering

Academic year 2022-2023

| 1. IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| Degree | Degree in Mining Resources Engineering | | Type and Year | Compulsory. Year 4 |
| Faculty | School of Mines and Energy Engineering | | | |
| Discipline | Subject Area: Mining Pre-Technology<br>Module: Training in Common with the Mining Branch | | | |
| Course unit title and code | G629 - Environmental Technology in Mining | | | |
| Number of ECTS credits allocated | 6 | Term | Semester based (1) | |
| Web | | | | |
| Language of instruction | English | | Mode of delivery | Face-to-face |

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|---|---|
| Department | DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE |
| Name of lecturer | CARLOS RICO DE LA HERA |
| E-mail | carlos.rico@unican.es |
| Office | E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO (2032) |
| Other lecturers | ANA LORENA ESTEBAN GARCIA<br>RUBEN DIEZ MONTERO |

| 3.1 LEARNING OUTCOMES |
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| - Ability to interpret a basic analysis of water . |
| - Capacity to design simple water treatment processes |
| - Ability to identify or characterize a waste or a contaminated soil |
| - Simple design capacity of simple waste treatment systems or recovery of contaminated soils |
| - Ability to identify environmental management tools and to interpret environmental indicators. |
| - Ability to identify the need to perform an Environmental Impact Assessment and to apply simple methods to study the Environmental Impact |
| - Capacitiy to control the atmosphere of the mine |

| 4. OBJECTIVES |
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| Knowing the basics of Environmental Engineering |
| Interpret basic water quality analysis |
| Basic design of water treatment processes by origin and specific objectives |
| Classify wastes according to its properties and characteristics |
| Categorize soils according to its pollution content |
| Design basic treatment systems for wastes and polluted solis |
| Knowing the environmental management tools and their applicability. |
| Knowing the applicability of the Environmental Impact Assessment and methods to study the Environmental Impact in the mining framework. |

| 6. COURSE ORGANIZATION | |
|---|---|
| CONTENTS | |
| 1 | Introduction to environmental technology.<br>Environmental management. Public health. Environmental toxicology. Environmental engineering. Air pollution. Water quality. Impurities and water contaminants. Characterization of the water |
| 2 | Mine atmosphere.<br>The air in the mine. Firedamp. Firedamp explosions. Dust at mine sites. |
| 3 | Ventilation Theory.<br>Data collection, circuits and basic formulas. Mechanical ventilation equipment. Ventilation facilities. Secondary ventilation. |

| 7. ASSESSMENT METHODS AND CRITERIA | | | | |
|---|---|---|---|---|
| Description | Type | Final Eval. | Reassessn | % |
| Description<br>Reports of field visits | Work | No | No | 10,00 |
| Description<br>Coursework | Work | No | Yes | 15,00 |
| Description<br>Lab practices | Laboratory evaluation | No | No | 15,00 |
| Description<br>Exam | Written exam | Yes | Yes | 60,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| The exam will have theoretical and problem parts. | | | | |
| Observations for part-time students | | | | |
| According to regulations of the University | | | | |

| 8. BIBLIOGRAPHY AND TEACHING MATERIALS |
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| BASIC |
| Introduction to Environmental Engineering (Fifth Edition). Mackenzie L. Davis, David A. Cornwell. McGraw-Hill, 2013. |
| Wastewater Engineering: Treatment and Reuse (Fourth Edition). George Tchobanoglous, Franklin L. Burton, H. David Stensel. McGraw-Hill, 2003. |
| Industrial Water Pollution Control (Second Edition). W. Wesley Eckenfelder. McGraw-Hill, 1989. |
| Integrated Solid Waste Management: Engineering Principles and Management Issues. George Tchobanoglous, Hilary Theisen, Samuel Vigil. McGraw-Hill, 1993. |