ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

63000279 - Seminars I

DEGREE PROGRAMME

06AK - Master Universitario En Mineria Sostenible

ACADEMIC YEAR & SEMESTER

2024/25 - Semester 1

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E.T.S. de Ingenieros de
Minas y Energía

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Learning guide

1. Description

1.1. Subject details

Name of the subject	63000279 - Seminars I
No of credits	6 ECTS
Type	Optional
Academic year ot the programme	First year
Semester of tuition	Semester 1
Tuition period	September-January
Tuition languages	English
Degree programme	06AK - Master Universitario en Mineria Sostenible
Centre	06 - Escuela Técnica Superior De Ingenieros De Minas Y Energía
Academic year	2024-25

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Rogelio De La Vega Panizo	602	rogelio.delavega@upm.es	Sin horario.
Pedro Mora Peris	214	pedro.mora@upm.es	Sin horario.
Luis Iglesias Martinez (Subject coordinator)	601	luis.iglesias@upm.es	M - 09:00 - 11:00 W - 09:00 - 11:00 F - 09:00 - 11:00
Ricardo Lain Huerta	216	ricardo.lain@upm.es	Sin horario.

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

2.3. External faculty

Name and surname	Email	Institution
Juan Francisco Llamas Borrajo	jjuan.llamas@upm.es	Departamento de Energía y Combustibles
María Jesús García Martínez	mj.garcia@upm.es	Departamento de Energía y Combustibles
Yolanda Sánchez Palencia	yolanda.sanchezpalencia@upm.es	Departamento de Energía y Combustibles
Marcelo Fabián Ortega Romero	mf.ortega@upm.es	Departamento de Energía y Combustibles

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

3.2. Other recommended learning outcomes

- Soil and water pollution from mine operations: Basic knowledge of chemistry and environmental issues in mining process.

- Mine backfill: Basic knowledge of Rock Mechanics, Soil. Mechanics and Mining Methods.

- Drones in mining: Basic knowledge of Geomatics (Geodesy, Cartography, Topography and Geographical Information Systems-GIS)

- Remote sensing: Basic knowledge of Geomatics (Geodesy, Cartography, Topography and Geographical Information Systems-GIS)

- Soil and water remediation techniques: Basic knowledge of chemistry, mainly about physicochemical properties and partition coefficients of compounds.

- Advanced topics on mine safety: Basic knowledge of mining and industrial processes

4. Skills and learning outcomes *

4.1. Skills to be learned

CG1 - To apply knowledge in advanced science and technology to the professional or research practice of Mining Engineering

CG2 - To be able to design, develop, implement, manage and improve products, systems, and processes in different environments of the mining activity, using advanced analytic, computational or experimental techniques.

CG3 - To understand the impact that Mining of mineral and energetic resources has on the environment, the sustainable development of society and the importance of working in a professional and responsible environment.

CG4 - Capacity to learn in an international context and complex environments, multidisciplinary and bilingual (English-Spanish).

CG5 - Organizing, planning and management in a business environment and other institutions and organizations of advanced projects and human teams.

CG6 - Creativity

4.2. Learning outcomes

RA35 - To understand how neural networks operate.

RA36 - To understand and apply the strategic concepts of safety and health in the mining industry for its assessment. To understand the manage and social factors associated with prevention of laboral risks in the mining industry. To apply the main analysis, control and safety management tools and analysis techniques. Safety and health KPI.

RA38 - Understand the basics of RPAS (drones). Analyze and evaluate the applicability of drones in mining, including mining exploration and operations, security and environmental aspects.

RA31 - Understand the information they provide and the limitations of remote sensing tools in solving problems in mining activities.

RA37 - Understand the advantages and disadvantages of the different remediation techniques. Identify if a technique could be suitable of not depending on the physicochemical properties of the chemicals and other considerations as type of soil, time and money needed. Choose, among the different techniques, the best option or

the best combination for a particular problem.

RA32 - Understand the environmental problems as a whole, identifying all the processes involved and the possible interrelationships. Searching, identifying, evaluating and integrating the bibliography and the information exist about a problem, until achieving a scenario that allows identifying and integrating the processes that act on the area.Present hypotheses and proposals to validate or discard them.

RA30 - Know the different backfill materials and methods. Select the more appropriate backfill method according to the mining method. -Know the methodology of laboratory tests to estimate backfill properties. Prepare a paste fill memorandum.

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

Seminars I offers the student a group of short courses (seminars) to supplement his formation. The student must choose at least 6 credits. Skills depend on the seminars offered and chosen by the student.

Mine backfill

Different materials for backfill

Mining Backfill Methods

- Hydraulic

- Paste

- Rock

Properties of backfill. Laboratory tests

Stability of backfill

Paste plant and distribution system

Radar Remote sensing

1. Introduction

2. Physical Principles of Remote Sensing

3. Platforms and Imaging Systems.

4. Analysis and Interpretation of Data

Soil and water remediation techniques

? Overview of three different types of remediation techniques classification.

? Overview of criteria needed to choose among different remediation options.

? Overview of physicochemical, thermal and biological remediation techniques.

Advanced topics on mine safety

Sustainability and mining company:

? Productive organizations and security.

? Health and safety risk agents.

? Risk prevention techniques.

? Statistical control of accidents.

? Psychosociology.

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? Ergonomics.

? Risk assessment and security reviews.

? Costs of accidents at work.

? Industrial health objectives. Health branches.

? Control of exposures to chemical agents.

? Carcinogens and mutagens.

? Noise.

? Vibrations.

? Health in the extractive industry.

Neural networks

Neuron Model

Network Architectures

Perceptron

Optimization

Backpropagation

Examples

Drones in mining

1. Introduction to Remotely Piloted Aircraft Systems (RPAS).

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2. Operations with RPAS.

3. Principles of photogrammetry with RPAS.

4. RPAS mining applications:

A. Mining exploration.

a) Geological modeling and resource evaluation.

b) Mine design and planning.

c) Risk management.

d) Environmental impact studies

B. Planning and management of mining work.

a) Management and control of mining work (blasting, material extraction, transportation).

5.2. Syllabus

1. Mine backfill

2. Remote sensing

3. Soil and water pollution from mine operations

4. Soil and water remediation techniques

5. Advanced topics on mine safety

6. Neural networks

7. Drones in mining

6. Schedule

6.1. Subject schedule*

Week	Type 1 activities	Type 2 activities	Distant / On-line	Assessment activities
1	**Seminarios 1 - primera semana de 4** Duration: 15:00 Lecture			
2	**Seminarios 1 - segunda semana de 4** Duration: 15:00 Lecture			
3	**Seminarios 1 - tercera semana de 4** Duration: 15:00 Lecture			
4	**Seminarios 1 - cuarta semana de 4** Duration: 15:00 Lecture			**Seminarios 1 - evaluación** Written test Global examination Not Presential Duration: 05:00 **Evaluación** Written test Progressive assessment Presential Duration: 05:00
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
4	Evaluación	Written test	Face-to-face	05:00	100%	5 / 10	CG1 CG2 CG3 CG4 CG5 CG6

7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
4	Seminarios 1 - evaluación	Written test	No Presential	05:00	100%	5 / 10	CG1 CG2 CG3 CG4 CG5 CG6

7.1.3. Referred (re-sit) examination

No se ha definido la evaluación extraordinaria.

7.2. Assessment criteria

Oral and/or written test used in the initial, formative, or summative examination of the student.

Student study: individual preparation through reading, problem solving, work preparation, reports, etc. to expose or deliver in theoretical or practical classes.

The evaluation system of each seminar will be exposed in the first session and will be based on:

- Written or oral tests of theory or problems.
- Individual or team work.
- Attitude evaluation, attendance and class participation.
- Reports or projects.

8. Other information

8.1. Other information about the subject

Seminars I offers the student a group of short courses (seminars) to supplement his formation. The student must choose at least 6 credits. Skills depend on the seminars offered and chosen by the student.

Contents depend on the seminars offered and chosen by the student.

Learning results, Contents, Skills, Training activities, Teaching methodologies and Evaluation systems depend on the seminars offered and chosen by the student.