

## SUBJECT TEACHING GUIDE

### 1119 - Advanced explosives

Master's Degree in mining engineering

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Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in mining engineering Master's Degree in mining engineering			Type and Year	Compulsory. Year 2 Compulsory. Year 2
Faculty	School of Mines and Energy Engineering				
Discipline	MINING				
Course unit title and code	1119 - Advanced explosives				
Number of ECTS credits allocated	3	Term	Semester based (1)		
Knowledge Field	Architecture, construction, building and urban planning, civil engineering Architecture, construction, building and urban planning, civil engineering				
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				
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Other lecturers					

#### 4. OBJECTIVES

The objectives of this subject consist of providing the student specific training about explosives and pyrotechnic elements, considering both the user's and manufacturer's approaches. The student will gain knowledge about the legal framework (paying special attention to safety issues), special types of blasts, the mitigation of undesired effects of blasting, and current trends in the field of explosives.

6. SUBJECT PROGRAM	
CONTENTS	
1	Introduction.
2	Specific legislation on blasting.
3	Blasting Project.
4	Special typologies and blasting design.
5	Minimization of adverse blasting effects and safety.
6	New Technologies.
7	Manufacture and management of explosives and pyrotechnic material.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Written Evaluation - Final Content Examination	Written exam	Yes	Yes	60,00
Evaluation through work - Group work.	Work	No	Yes	25,00
Practical Evaluation - Practices - Resolution of exercises.	Others	No	Yes	15,00
<b>TOTAL</b>				<b>100,00</b>
Observations				
In order to pass the subject, the student will be required to get a minimum score of 4.0/10 in the Final Exam of Contents, and an average global score of 5.0/10. If these requirements are not satisfied, the final score will be obtained as the weighted average of the different items of evaluation, until a maximum of 4.9. Any passed item would be kept for the extraordinary evaluation.				
Observations for part-time students				
Part-time students will be evaluated according 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. However, the Group Essay could be replaced by an Individual Essay about the same topic if the part-time student required it.				

**8. BIBLIOGRAPHY AND TEACHING MATERIALS**

**BASIC**

Ríos Vázquez, J. Curso Básico de Explosivos. Oviedo: Fundación Luis Fernández Velasco. 2009.

Explosivos y accesorios. Madrid: UEE. 1990.

Destrucción de explosivos industriales. Madrid: UEE. 1990.

Manual de empleo de explosivos. Madrid: UEE. 2003.

Carmona Pastor, F. Transporte de Mercancías Peligrosas. Explosivos. Madrid: Díaz de Santos. 2002.

Bernaola Alonso, J. Fundamentos de diseño de Voladuras. Madrid: Fundación Gómez Pardo. 2008.

Blasters' Handbook, 18 th Edition. Cleveland: International Society of Explosives Engineers. 2011.

Johansen, J. in association with Mathiesen, C.F. Modern trends in tunnelling and blast design. Rotterdam: A.A. Balkema. 2000.

Langa Fuentes, E. Demoliciones por voladura. Madrid: Fueyo. 2011.

Reglamento general de normas básicas de seguridad minera e instrucciones técnicas complementarias (ITC) : SMI / Ministerio de Industria, Turismo y Comercio.

Plá Ortiz de Urbina, F., Mecía Andrés, L. y López Jimeno, C. Perforación y voladura. Madrid: Fundación Gómez Pardo. 1978.

Sanchidrián Blanco, J.A y Muñiz, E. Curso de Tecnología de Explosivos. Madrid: Fundación Gómez Pardo. 2000.

Urbanski, T. Chemistry and Technology of Explosives. Oxford: Pergamon; Warszawa: PWN Polish Scientific Publishers. 1965.

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Apuntes proporcionados al comienzo del curso.