

## SUBJECT TEACHING GUIDE

### 609 - Railway Engineering

#### Master's Degree in civil Engineering, Canal and Port Engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Master's Degree in civil Engineering, Canal and Port Engineering			Type and Year	Optional. Year 2
Faculty	School of civil Engineering				
Discipline	SPECIALITY IN TRANSPORT, URBAN PLANNING AND LAND MANAGEMENT				
Course unit title and code	609 - Railway Engineering				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. TRANSPORTES Y TECNOLOGIA DE PROYECTOS Y PROCESOS				
Name of lecturer	BORJA ALONSO OREÑA				
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Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 1. DESPACHO BORJA ALONSO OREÑA (1008)				
Other lecturers	LUIGI DELL'OLIO ANDRES RODRIGUEZ GUTIERREZ				

### 3.1 LEARNING OUTCOMES

- Know the fundamental aspects of railway signaling and the control and operation systems of railway traffic.
- Recognize the different signaling systems and, based on this, calculate the capacity of the railway lines.
- Know the components of the equipment of the security and signaling systems.
- Dimensioning metropolitan rail services: including supply, signaling and control, capacity and demand.

#### 4. OBJECTIVES

To transmit to the students advanced notions of urban, metropolitan railroad signaling and of medium and long distance lines.  
Dimensioning metropolitan railway lines: capacity lines and stations.

#### 6. COURSE ORGANIZATION

CONTENTS	
1	Railway signaling basics
2	Metropolitan Railways I: Planning, infrastructure, rolling stock and facilities
3	Metropolitan Railways II: Stations, operation and capacity
4	Performance indicators
5	Tram-Light Rail Transit
6	Course work
7	Metro/Tram/Cercanías Facilities Visit

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Team work	Work	Yes	Yes	90,00
Practices in Class	Others	No	No	10,00
TOTAL				100,00

##### Observations

In relation to the agreements adopted in the ordinary session of the School Board held on June 10, 2010, it is established that, with respect to the evaluation activities that are recoverable,

- As a general criterion and unless something different is specified in this guide , a student may only present for recovery of those activities that have not been passed, that is, in which they have not obtained a minimum grade of five out of ten.
- As a general criterion and unless something different is specified in this guide , in the recovery period the evaluation procedure of an activity will be the same as that of the activity that originates it.

Note: According to Royal Decree RD 1125/2003 on the European credit system and the grading system in official university degrees and valid throughout the national territory, the results obtained by the student in each of the subjects of the plan Studies will be graded according to the following numerical scale from 0 to 10, with an expression of one decimal place, to which their corresponding qualitative score may be added:

0.0-4.9: Suspense (SS). 5.0-6.9: Pass (AP). 7.0-8.9: Notable (NT). 9.0-10: Excellent (SB).

##### Observations for part-time students

Attendance is not mandatory, but completion of the proposed course work is mandatory.

#### 8. BIBLIOGRAPHY AND TEACHING MATERIALS

##### BASIC

Alonso, B., dell'Olio, L., Moura, J.L. (2021) Ingeniería Ferroviaria. Apuntes de la asignatura

