

## SUBJECT TEACHING GUIDE

G1571 - Railways and Railway Infrastructures (Transport)

Degree in Civil Engineering

Academic year 2021-2022

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering			Type and Year	Optional. Year 4
Faculty	School of civil Engineering				
Discipline	Subject Area: Transport Infrastructures (Transport)				
Course unit title and code	G1571 - Railways and Railway Infrastructures (Transport)				
Number of ECTS credits allocated	6	Term	Semester based (1)		
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	LUIGI DELL'OLIO				
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Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 1. DESP. ALUMNOS FIN DE CARRERA FF.CC. (1016)				
Other lecturers	BORJA ALONSO OREÑA				

3.1 LEARNING OUTCOMES
- Learn Railways Engineering, theory and practice.
- Understand the operation and relation between the different elements and systems in the railways superstructure . How do they work?
- Design, project, construction and maintenance activities
- Learn management techniques in a rail network.
- Learn to forecast travel demand in railways service.
- DeDevelopment and application of mathematical models in management, and construction of railways

#### 4. OBJECTIVES

The general objective of this course is to provide students with the basic knowledge not only in railway engineering from the structural point of view (infrastructure and superstructure) but in management and operation techniques (maintenance, demand, signalling and rail operations).

Familiarize students with the methods of designing in railways, calculation of elements of the superstructure, infrastructure, obtaining demand, management and operation of railway lines and stations.

#### 6. COURSE ORGANIZATION

##### CONTENTS

1	Railway transport.
2	Regulatory framework.
3	A general overview of the track structure.
4	Track platform.
5	Superstructure elements: Rail, sleepers, Joints and fastenings systems, ballast layer.
6	Switches and crossings. Turnouts.
7	Track geometry.
8	Rail mechanics. An overview.
9	Maintenance and renewal operations in railways.
10	Signalling and operation.
11	Schedule design.
12	Infrastructure models.
13	Travel time forecast.
14	Railway capacity.
15	Stations.
16	Models to forecast railways demand.
17	Railway project.

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Team work	Work	Yes	No	10,00
First midterm exam	Written exam	No	Yes	45,00
Second midterm exam	Written exam	No	Yes	45,00
TOTAL				100,00
Observations				
Evaluation criteria according to University of Cantabria procedures regulated on RD 1125/2003 and on 'evaluation activities' approved by the Civil Engineering School Assembly on June, 10th, 2010				
Observations for part-time students				
Attendance is not mandatory, but is mandatory realization of team work				

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

García Díaz-de-Villegas, J.M. (2007) Ferrocarriles. Publicaciones de la E.T.S. Ingenieros de Caminos, Santander.

López Pita, A. (2006) Infraestructuras ferroviarias. Edición UPC.

López Pita, A. (2008) Explotación de líneas de ferrocarril. Edición UPC.

Maynar, M. y Fernández González, F.J. (2007) Ferrocarriles Metropolitanos y tranvías. 3 edición. Colegio de Ingenieros de Caminos.