SUBJECT TEACHING GUIDE

G1989 - Railways

Degree in Civil Engineering
First Degree in Civil Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering First Degree in Civil Engineering			Type and Year	Compulsory. Year 4 Compulsory. Year 4
Faculty	School of civil Engineering				
Discipline	INFRASTRUCTURES OF TRANSPORT				
Course unit title and code	G1989 - Railways				
Number of ECTS credits allocated	6	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	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.
- Design, project, construction and maintenance activities.
- Learn management techniques in a rail network.
- Development 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).

Know and know how to apply the design methods of a railway track, calculation of superstructure elements, demand determination, management and operation of railway lines and stations.

6. SUBJECT PROGRAM

CONTENTS	
1	Regulatory framework and operations.
1.1	Overview on Railway Transport. Background. Management system and regulatory framework in Railways.
1.2	A general overview of the track structure. Electrification.
1.3	Rolling Stock.
1.4	Traction and Adherence.
2	Infrastructure and superstructure. Railway project.
2.1	Platform and ballast in the track structure.
2.2	Rail and Sleepers in the track.
2.3	Joints and fastening systems.
2.4	Switches and crossings. Turnouts.
2.5	Track geometry. Railway Project Workshop.
2.6	Rail track mechanics.
2.7	Slab track. Concept and construction techniques.
2.8	Maintenance and renewal operations in railways.
3	Planning and management.
3.1	Railway Stations.
3.2	Service planning.
3.3	Signaling and operation.
3.4	Visit (optional) to the Adif-RAM Operations Management Center in Santander.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Midterm Exam	Written exam	No	Yes	40,00
Final Exam	Written exam	Yes	Yes	45,00
Individual work	Work	Yes	No	15,00
TOTAL				100,00

Observations

The grade of theoretical parts or problems, separately, of a partial not approved, will not be kept.
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 have the character of recoverable,
- As a general criterion and unless otherwise specified in this guide, a student will only be able to present himself/herself for the recovery of those activities that he/she has not passed, that is to say, in which he/she has not obtained a minimum grade of five out of ten.
- As a general criterion, and unless otherwise specified in this guide, in the recovery period the procedure of evaluation of an activity will be the same as that of the activity that originates it.
Only for duly justified reasons (e.g. health restrictions) may the evaluation tests be organized remotely, with the prior authorization of the distance, with the previous authorization of the Direction of the Center.
Note: According to the Royal Decree RD 1125/2003 on the European credit system and the grading system in official university degrees and the university degrees of an official nature and valid throughout the national territory , the results obtained by the student in each one of the subjects of the
each of the subjects of the syllabus will be graded according to the following numerical scale from 0 to 10, with one decimal place, to the one decimal place, to which the corresponding qualitative grade may be added:
0.0-4.9: Fail (SS).
5,0-6,9: Pass (AP).
7.0-8.9: Notable (NT).
9.0-10: Outstanding (SB).

Observations for part-time students

Class attendance is not compulsory. The evaluation will be based on the grades obtained in the evaluation tests.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Apuntes de la asignatura en Moodle.