



Universidad de Jaén
School of Engineering of Linares

Railways and guided transport

2024-2025

Grado en Ingeniería Civil
Doble Grado en Ingeniería de Tecnologías Mineras e Ingeniería Civil



CREA



Guías docentes UJA

Horarios de tutorías

Llamamientos PAU

Syllabus 2024-25 - 14012009 - Railways and Guided Transport (Ferrocarriles y transporte guiado)

Caption

- Level 1: Tutorial support sessions, materials and exams in this language
- Level 2: Tutorial support sessions, materials, exams and seminars in this language
- Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

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Full version (Spanish)

English

DEGREE: Grado en Ingeniería civil (14012009)
 FACULTY: SCHOOL OF ENGINEERING OF LINARES
 DEGREE: Doble grado en Ingeniería de tecnologías mineras e Ingeniería civil (15012010)
 FACULTY: SCHOOL OF ENGINEERING OF LINARES
 ACADEMIC YEAR: 2024-25
 COURSE: Railways and Guided Transport

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Railways and Guided Transport
 CODE: 14012009 (*) ACADEMIC YEAR: 2024-25
 LANGUAGE: English LEVEL: 2
 ECTS CREDITS: 6.0 YEAR: 4 SEMESTER: SC

2. LECTURER BASIC INFORMATION

NAME: CASTILLO MARTÍNEZ, AGUSTÍN
 DEPARTMENT: U121 - INGENIERÍA MECÁNICA Y MINERA
 FIELD OF STUDY: 510 - INGENIERIA DE LA CONSTRUCCIÓN
 OFFICE NO.: D - 67 E-MAIL: acmartin@ujaen.es P: 953648674
 WEBSITE: <https://www.ujaen.es/departamentos/ingmec/contactos/castillo-martinez-agustin/>
 ORCID: -
 LANGUAGE: - LEVEL: 2

3. CONTENT DESCRIPTION

A. INTRODUCTION TO RAILROAD SYSTEM.

Transportation system. Railroad system. Railroad in Spain. Railroad in Europe. High speed railroad. Service measurement units.

B. RAILWAY TRACK STRUCTURE.

Introduction. Rails. Railway sleepers. Fasteners. Foundation layers. Platform. Joints. Long welded bar technology. Plate railway. Railway apparatus.

C. RAILWAY MECHANICS.

Railway design. Vertical behaviour. Foundation layer and platform behaviour. Horizontal stress in railways.

D. RAILWAY GEOMETRY AND LAYOUT.

Railway geometry. Straight layout rectification.

E. RAILWAY UPKEEP AND QUALITY CONTROL PROCEDURES.

Railway quality. Railway upkeep. Railway Machinery.

F. RAILWAY DYNAMICS.

Electrification systems. Railroad vehicles. Traction and adherence.

G. TECHNICAL MANAGEMENT.

Passenger stations and terminals. Freight terminals. Security and signage.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

- During theoretical classes, participation will be encouraged. An integral approach to the subject will be applied.
- Practical classes will include:
 - Visits to railroad station, tramway facilities, sleepers construction factory.
- - Railway design using Civil3D computer tool.
 - Conference by a railroad engineer specialist.

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

- Theoretical test and Practical reports MUST be passed in order to pass the whole subject.
- Theoretical test will be comprised of a pure theory test (valued 50%) and an applied test (valued 50%). In order to pass the test as a whole, at least 40% of the score must be attained in each part.

6. BOOKLIST ([Access the bibliography in the Library catalog](#))

MAIN BOOKLIST:

- Design of high-speed railway turnouts : theory and applications . Edition: -. Author: Wang, Ping, author.. Publisher: Academic Press ([Library](#))

ADDITIONAL BOOKLIST:

- theory and method of design and optimization for Railway Intelligent Transportation Systems (RITS) [electronic resource] . Edition: -. Author: Zhou, Wang.. Publisher: Bentham Science Publishers Ltd. ([Library](#))

7. SUSTAINABLE DEVELOPMENT GOALS

Industria, innovación e infraestructura

Ciudades y comunidades sostenibles

DETAILED INFORMATION

Historic railroad developments will be considered in this course, in order to be able to apply these historic designs in developing countries. In addition, recycled materials for railroad construction will be considered, in order to promote UN SDGs #9 and #11.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

1. TEACHING METHODOLOGY

Actividades Formativas	Formato (presencial/online)*	Metodología docente Descripción
31 THEORETICAL SESSIONS	50% <i>presential</i>	31 theoretical classes (1 hour each). 50% of students present, rest can attend through videoconference
14 PRACTICAL SESSIONS	50% <i>presential</i>	14 practical classes (1 hour each). 50% of students present, rest can attend through videoconference
1 railroads engineering specialist videoconference	<i>Online</i>	2 hours Students must write an essay about the main topics presented

6 practical computer sessions	50% <i>presential</i>	6 hours Students will learn how to use Civil3D design computer tool
Tutorships	<i>Presential + Online</i>	Some tutorships will be provided online

2. EVALUATION SYSTEM

Ordinary Call

Test	Format	Description	Percentage
Active participation during classes	50% <i>presential</i>		5%
Exercises and essays	<i>Presential and online</i>		5%
Main test	<i>Presential</i>	Theoretical (50%) and applied (50%) questions will be presented to be addressed in oral and/or written form. 40% of the score must be attained in each part in order to pass the subject	50%
Practical	50% <i>presential</i>	Railway design using Civil3D computer tool and essay about specialist conference must be delivered. 80% of assistance is mandatory in order to pass the subject. If not passed during ordinary call, an exam must be passed at extraordinary call. Practical part of subject must be passed in order to pass the subject as a whole	20%
Project	<i>Online</i>	Railway project, according to teacher's directives	20%

Extraordinary call (*)

Test	Format	Description	Percentage
Active participation during classes	50% <i>presential</i>		5%
Exercises and essays	<i>Presential and online</i>		5%

Main test	<i>Presential</i>	Theoretical (50%) and applied (50%) questions will be presented to be addressed in oral and/or written form. 40% of the score must be attained in each part in order to pass the subject	50%
Practical	<i>50% presential</i>	Railway design using Civil3D computer tool and essay about specialist conference must be delivered. 80% of assistance is mandatory in order to pass the subject. If not passed during ordinary call, an exam must be passed at extraordinary call. Practical part of subject must be passed in order to pass the subject as a whole	20%
Project	<i>Online</i>	Railway project, according to teacher's directives	20%

(*) For extraordinary call I, student qualifications during the former year will be considered, except the main test, that must be taken. Percentages of the non-presential scenario for the former year apply.

3. RESOURCES

Recursos	Descripción
Student Computers	Student PCs, with free or licensed software installed
University Computers	On-campus free-access computers
Internet connection	Student (home) or University (on-campus)
Google Meet	UJA Official videoconference suite
PLATEA	UJA Official web-based resources platform

9. VIRTUAL TEACHING SCENARIO

1. TEACHING METHODOLOGY

Actividades Formativas	Formato (presencial/online)*	Metodología docente Descripción
31 THEORETICAL SESSIONS	<i>Online</i>	31 theoretical classes (1 hour each). Students attend through videoconference
14 PRACTICAL SESSIONS	<i>Online</i>	14 practical classes (1 hour each). Students attend through videoconference

1 roads/airports engineering specialist videoconference	Online	2 hours Students must write an essay about the main topics presented
6 practical computer sessions	Online	6 hours Students will learn how to use Civil3D design computer tool
Tutorships	Online	Tutorships will be provided online

2. EVALUATION SYSTEM

Ordinary Call

Test	Format	Description	Percentage
Active participation during classes	Online		5%
Exercises and essays	Online		5%
Main test	Online	Theoretical and applied questions will be presented to be addressed in oral and/or written form. 40% of the score must be attained in order to pass the subject. Test will be done using videoconference tool, so image and sound must be provided by the student for the whole examination time. Test will be recorded. At the end of the test, the student will be required to photograph or scan his/her paper, and to upload the files to the Web Virtual Platform (PLATEA)	50%
Practical	Online	Railway design using Civil3D computer tool and essay about specialist conference must be delivered. 80% of assistance is mandatory in order to pass the subject. If not passed during ordinary call, an exam must be passed at extraordinary call. Practical part of subject must be passed in order to pass the subject as a whole	20%
Project	Online	Railway project, according to teacher's directives	20%

Extraordinary call (*)

Test	Format	Description	Percentage
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Active participation during classes	Online		5%
Exercises and essays	Online		5%
Main test	Online	Theoretical and applied questions will be presented to be addressed in oral and/or written form. 40% of the score must be attained in order to pass the subject. Test will be done using videoconference tool, so image and sound must be provided by the student for the whole examination time. Test will be recorded. At the end of the test, the student will be required to photograph or scan his/her paper, and to upload the files to the Web Virtual Platform (PLATEA)	50%
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Project	Online	Railway project, according to teacher's directives	20%

(*) For extraordinary call I, student qualifications during the former year will be considered, except the main test, that must be taken. Percentages of the non-presential scenario for the former year apply.

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DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es

Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es