



Universidad de Jaén
School of Engineering of Linares

Metallic structures

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 - 14012007 - Metallic Structures (Estructuras metálicas)

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 (14012007)
 FACULTY: SCHOOL OF ENGINEERING OF LINARES
 DEGREE: Doble grado en Ingeniería de tecnologías mineras e Ingeniería civil (15012008)
 FACULTY: SCHOOL OF ENGINEERING OF LINARES
 ACADEMIC YEAR: 2024-25
 COURSE: Metallic Structures

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Metallic Structures
 CODE: 14012007 (*)
 LANGUAGE: English
 ECTS CREDITS: 6.0
 ACADEMIC YEAR: 2024-25
 LEVEL: 1
 YEAR: 4
 SEMESTER: PC

2. LECTURER BASIC INFORMATION

NAME: CAMACHO SAMPEDRO, JOSÉ
 DEPARTMENT: U121 - INGENIERÍA MECÁNICA Y MINERA
 FIELD OF STUDY: 605 - MECÁNICA DE MEDIOS CONTINUOS Y TEORÍA DE ESTRUCTURAS
 OFFICE NO.: D - 068
 E-MAIL: jsampedr@ujaen.es
 P: 953648678
 WEBSITE: -
 ORCID: -
 LANGUAGE: -
 LEVEL: 1

3. CONTENT DESCRIPTION

Block A. Metallic structures

Unit 1. Introduction to metallic structures
 Unit 2. Technological properties of materials for steel structures
 Unit 3. Durability of steel structures

Block B. Design and verification

Unit 4. Basis of design
 Unit 5. Advanced topics in Mechanics of Materials
 Unit 6. Ultimate limit states
 Unit 7. Serviceability limit states
 Unit 8. Plated structural elements

Block C. Joints of structural members

Unit 9. Introduction to joints in steel structures
 Unit 10. Connections made with bolts or pins
 Unit 11. Welded connections

Block D. Composite structures

Unit 12. Introduction to composite structures

Block E. Execution and maintenance

Unit 13. Fabrication and erection of steel structures

Unit 14. Quality management

Unit 15. Maintenance of steel structures

PRACTICE

Practice 1. Global analysis

Practice 2. ULS and SLS verifications

Practice 3. Plated structural elements

Practice 4. Joints

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

During the lectures, the different sections included in the course's syllabus will be developed. Student participation may take place at any time and doubts will be solved at the time. During lectures the problems of the course included in the collections of problems will be solved in a participatory way and discussion of results and resolution methods will be exposed.

The practices, which will be developed in the computer room, will be the result of the direct application of the contents of the subject to the calculation of industrial buildings and constructions of civil works. they will have two or three parts: the first one expository, where the teacher will explain the tasks to be carried out, the remaining ones of the students' work on laboratory equipment.

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

S1. Attendance in practical sessions (5%)

- Attendance will be controlled in the practical sessions.

S2. Theoretical and operational knowledge of the subject (90%)

- Final written exam that will consist of two parts:
 - Theoretical knowledge:** objective multiple-choice test that will be weighted with 30% of the overall exam grade. It will be necessary to score more than 3 points out of 10 in theoretical knowledge, to add the points obtained in each of the parts of the theoretical exam.
 - Operational knowledge:** problem solving that will be weighted with 70% of the overall mark of the exam.
- The following learning results are assessed: 3, 9, 10 and 11.
- The following skills are assessed: CC6 and CG1.

S4. Practical cases and exercises (5%)

- Practices related to the content taught in the theoretical classes will be carried out. The student must submit a report for each of the practices and the average evaluation of these reports must be equal to or greater than 5 to consider them approved. To pass the subject it will be necessary to pass independently both the Exam and the Practices. In the case of not passing or not delivering the proposed practices, the student will not be able to pass the subject in the ordinary call and will have to pass a practical exam that will be held in the extraordinary call.
- The following learning results are assessed: 3, 9, 10 and 11.
- The following skills are assessed: CC6 and CG1.

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

MAIN BOOKLIST:

- Código estructural. Edition: -. Author: España Ministerio de la Presidencia, Relaciones con las Cortes y Memoria Democrática.. Publisher: Ministerio de Transportes, Movilidad y Agenda Urbana, Centro de Publicaciones ([Library](#))
- Estructuras de acero . Edition: 3ª ed.. Author: Argüelles Álvarez, Ramón, coaut. Publisher: Bellisco ([Library](#))
- Estructuras de acero: uniones y sistemas estructurales . Edition: -. Author: Argüelles Álvarez, Ramóncoaut.. Publisher: Bellisco ([Library](#))
- Design of joints in steel and composite structures : Eurocode 3, design of steel structures, part 1-8-- Design of joints : Eurocode 4, design of composite steel and concrete structures, part 1-1-- General rules and rules for buildings . Edition: -. Author: Jaspart, Jean-Pierre. Publisher: ECCS ([Library](#))
- Design of Steel Structures to Eurocodes. Edition: -. Author: I.Vayas, J.Ermopoulos, G.Ioannidis. Publisher: Springer Nature Switzerland ([Library](#))

- Diseño de estructuras de acero: eurocódigo 3: diseño de estructuras de acero Parte 1-1: reglas generales y reglas para edificios . Edition: 1ª ed.. Author: Simões da Silva, Luís. Publisher: Convención Europea de la Construcción Metálica ([Library](#))
- Design of plated structures: Eurocode 3 : Design of Steel Structures. Part 1-5 Design of Plated Structures . Edition: -. Author: Beg, Darko, coaut.. Publisher: ECCS ([Library](#))
- Design of Cold-formed Steel Structures. Edition: -. Author: D.Dubina, V.Ungureanu, R.Landolfo. Publisher: ECCS ([Library](#))
- Composite structures according to eurocode 4 : worked examples . Edition: -. Author: Dujmović, Darko, author.. Publisher: Ernst & Sohn ([Library](#))

ADDITIONAL BOOKLIST:

- Estructuras mixtas para edificación: según criterios del eurocódigo 4 . Edition: -. Author: Monfort Lleonart, José.. Publisher: Editorial de la UPV ([Library](#))
- Estructuras de acero. Vol.3 Vigas mixtas de edificación. Edition: -. Author: R. Argüelles. Publisher: Bellisco ([Library](#))
- Estructuras de acero. Vol.4 Inestabilidad. Edition: -. Author: R. Argüelles. Publisher: Bellisco ([Library](#))
- Estructuras de acero. Vol.5 Naves industriales. Edition: -. Author: R. Argüelles. Publisher: Bellisco ([Library](#))

7. SUSTAINABLE DEVELOPMENT GOALS

Educación de calidad

DETAILED INFORMATION

The subject in general, and especially the practices that students must carry out, involve the development of skills such as the management of current regulations in the field of structural engineering and the use of computer tools in the calculation of structures. In addition, students must submit reports that develop the work done to solve the practices, thus working on their written expression and critical reasoning skills. All of this contributes to SDG 4 - Quality Education.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

TEACHING METHODOLOGY

Teaching activities	Format site/online)* (on-	Teaching methodology Description
A1 Lectures	On-site 50%	Lectures as scheduled at the classroom assigned to a part of the group and retransmission by video conferencing to the rest, with rotation student periodic, as determined by the Center. There will be 2 weekly sessions of 2 and 1 hours respectively. In these sessions the teacher explains the concepts corresponding to the contents of the subject, and solves exercises related to the subject studied. Students will have supplementary material in Virtual Teaching.
A2 Lab Sessions	On-site 100%	Lectures as scheduled at the classroom assigned to a part of the group. The practices will be in the laboratory of continuous media mechanics and structure theory or in computer classrooms. In these sessions, the numerical computation of the structure of an industrial building is derived.
A3 Tutor hours	Online	Tutoring will be provided online through synchronous GSuite Meet.

(*) The Center may establish a different percentage of attendance depending on the number of students and capacity of the classroom/laboratory

ASSESSMENT METHODOLOGY

Ordinary call

Assesment	Format face / (face-to-online)	Description	Percentage

	synchronous or asynchronous)		
Written test	On-site	Domain of theoretical content and practical	50%
Laboratory / computer practice report.	Face-to-face / Asynchronous online	Delivery of practice reports. Structure of the Report. Quality of Documentation and Presentation	25%
Practical activities	Asynchronous online	Resolution of practical cases and application exercises	25%

Convocatoria extraordinaria

Assesment	Format (face-to-face / online synchronous or asynchronous)	Description	Percentage
Written test	On-site	Domain of theoretical content and practical	50%
Laboratory / computer practice report.	Face-to-face / Asynchronous online	Delivery of practice reports. Structure of the Report. Quality of Documentation and Presentation	25%
Practical activities	Asynchronous online	Resolution of practical cases and application exercises	25%

NOTE: To pass the subject it will be necessary to independently pass both the Exam and the Practices. On the other hand, in the theoretical exam it will be necessary to mark both theoretical and operational contents of the subject, having a grade greater than zero in each of these parts. The weight of theoretical content in the exam will be 30% compared to 70% of operational content (problems).

RESOURCES

The following shall be used as synchronous tools:

- Tutorials by videoconference using Google Meet.

As asynchronous tools the following shall be used:

- Presentations and solved exercises available in the virtual teaching platform.
- Scripts of practices provided in the virtual teaching platform.
- Consultation of doubts and tutor hours using the virtual teaching platform.

If the mixed or online scenario applies, the teaching staff reserve their right to not consent the recording, publication, transmission or reproduction of their speech, image, voice and other related teaching activities during the exercise of their duties at the University of Jaén.

9. VIRTUAL TEACHING SCENARIO

TEACHING METHODOLOGY

Teaching activities	Format (on-site/online)*	Teaching methodology Description
A1 Lectures	Online	There will be 2 weekly sessions of 2 and 1 hours respectively. Classes will consist of synchronous online classes through GSuite Meet, with duration equal to the number of hours of classroom teaching of the subject. The videos may be recorded and provided through the platform of the subject. In these videos, the professor

		exposes and explains the concepts corresponding to the contents of the subject, and exercises related to the studied subject are solved.
A2 Lab Sessions	Online	Practice sessions will be held synchronously in GMeet, and may be recorded and uploaded in the virtual teaching platform. They will have two parts, an expository, where the teacher will explain the tasks to be carried out and a part of group work of the students on the laboratory equipment. In these sessions, the numerical computation of the structure of an industrial building will be derived. The scripts will be provided prior to completing the practice in Virtual Teaching.
A3 Tutor hours	Online	The tutorials will be carried out online in synchronous mode using GSuite Meet.

SISTEMA DE EVALUACIÓN

Convocatoria ordinaria

Assesment	Format (face-to-face / online synchronous or asynchronous)	Description	Percentage
Written test	Synchronous online	Domain of theoretical content and practical	50%
Laboratory / computer practice report.	Asynchronous online	Delivery of practice reports. Structure of the Report. Quality of Documentation and Presentation	25%
Practical activities	Asynchronous online	Resolution of practical cases and application exercises	25%

Extraordinary call

Assesment	Format (face-to-face / online synchronous or asynchronous)	Description	Percentage
Written test	Synchronous online	Domain of theoretical content and practical	50%
Laboratory / computer practice report.	Asynchronous online	Delivery of practice reports. Structure of the Report. Quality of Documentation and Presentation	25%
Practical activities	Asynchronous online	Resolution of practical cases and application exercises	25%

NOTE: To pass the subject it will be necessary to independently pass both the Exam and the Practices. On the other hand, in the theoretical exam it will be necessary to mark both theoretical and operational contents of the subject, having a grade greater than zero in each of these parts. The weight of theoretical content in the exam will be 30% compared to 70% of operational content (problems).

RESOURCES

The following shall be used as synchronous tools:

- Tutorials by videoconference using Google Meet.

As asynchronous tools the following shall be used:

- Presentations and solved exercises available in the virtual teaching platform.
- Scripts of practices provided in the virtual teaching platform.
- Consultation of doubts and tutor hours using the virtual teaching platform.

If the mixed or online scenario applies, the teaching staff reserve their right to not consent the recording, publication, transmission or reproduction of their speech, image, voice and other related teaching activities during the exercise of their duties at the University of Jaén.

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