Universitat de Lleida

DEGREE CURRICULUM

STRUCTURES 2

Coordination: BRADINERAS ESCO, FRANCISCO JAVIER

Academic year 2023-24

STRUCTURES 2 2023-24

Subject's general information

<table>
<tr><td>Subject name</td><td>STRUCTURES 2</td></tr>
<tr><td>Code</td><td>101417</td></tr>
<tr><td>Semester</td><td>2nd Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Bachelor's Degree in Architectural Technology and Building Construction</td><td>2</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>6</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><td>PRAULA</td><td>TEORIA</td></tr>
<tr><th>Number of credits</th><td>3</td><td>3</td></tr>
<tr><th>Number of groups</th><td>1</td><td>1</td></tr>
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</td></tr>
<tr><td>Coordination</td><td>BRADINERAS ESCO, FRANCISCO JAVIER</td></tr>
<tr><td>Department</td><td>AGRICULTURAL AND FOREST SCIENCES AND ENGINEERING</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>60 Master class
90 Homework</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Spanish</td></tr>
<tr><td>Distribution of credits</td><td>29 hours of theory
31 hours exercises</td></tr>
</table>

STRUCTURES 2 2023-24

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BRADINERAS ESCO, FRANCISCO JAVIER	javier.bradineras@udl.cat	6	

Subject's extra information

Theoretical and practical course. Work using the recommended bibliography is very important.

The subject is studied in the 1st semester of the 2nd year of the degree.

This is included to the "Specific training module", specifically to the "Structures and facilities of the building" matter

We recommend attendance and resolution of proposed problems.

Case studies should be solved as soon as possible, it is not advisable to leave them to the last minute.

Learning objectives

- Calculate the internal forces that appear in the trusses structures
- Calculate the internal forces that appear in the frame structures
- Draw diagrams of the corresponding internal forces

Competences

University of Lleida strategic competences

- **UdL3**.- Master Information and Communication Technologies.

Degree-specific competences

- **GEE21**.- Ability to apply the technical rules to the building process and generate documents of tecnhical specifications of the construction procedures and methods of the buildings.
- **GEE22**.- Aptitude to apply the specific rules about installations to the building process.
- **GEE23**.- Aptitude for the predimentioning, design, calculation and checking of structures and for the direction of their material execution.
- **GEE24**.- Ability to constructively develop the installations of a building, control and plan their execution and verify the service and reception trials as well as those regarding maintainance.

Degree-transversal competences

- **EPS7**.- Ability to work in situations where information is lacking or you are under pressure.
- **EPS8**.- Ability to pan and organise the personal work.

Subject contents

1.-Systems of pinned bars. Isostatics

2.-Systems of pinned bars. Statically indeterminate.

3.-Systems of pinned bars. Mixed Systems with embedded pillars.

4.- Introduction to frame bar systems.

5.- Frame bar systems. Analytical method

6.- Frame bar systems. Matrix method

Methodology

* Lectures: Before beginning with the problems a theoretical introduction to each chapter of the course will take place.

* Problems: The main focus of the course is to learn to solve problems of strength of materials and structural design. After the theoretical introduction will arise and solve different kind of problems. Problems are conducted in small groups.

* Exercises to deliver: Students also have to solve problems individually or in groups. The problems solved and delivered in class will be used in the calculation of the final mark for the subject. These exercises will be conducted in small groups.

* Case Studies: At the end of each chapter, a case studie will be required. Students will submit a final report with all of them. This case is different for each student as data depends on the student identification number. This report will also have an important weight in the mark of the subject.

Development plan

Week	Chapters	Classroom working hours	Freelance working hours
1-2	Chapter 1	8	12
3-5	Chapter 2	12	18
6-8	Chapter 3	12	18
9	Chapter 4	4	6
10-12	Chapter 5	12	18
13-15	Chapter 6	12	18

Evaluation

Exams: 80% (2 partial 40%)

Case Studies: 10%

Teory and problems test: 10%

Máximum mark in second chance exam: 6

Alternative evaluation: 80% two partial exams + 20% one exercise from each chapter with the tool of the virtual campus.

Bibliography

* Cálculo Matricial de estructuras en 1er y 2do orden. Ramón Argüelles Álvarez

* Cálculo de estructuras. E.T.S.I.M. MADRID. Ramón Argüelles Álvarez

* Estructruas arquitectónicas e industriales, su cálculo. Enrique Nieto. ED. Tebar.

* Teoría y cálculo sobre estructuras resistentes de prismas rectos. Santiago Rico Fernando. Bellisco

* Análisis matricial de estructuras de barras, J. Mª Iglesias.Ediciones de la UdL. Eines16