



Universitat de Lleida

DEGREE CURRICULUM **STRUCTURES 2**

Academic year 2014-15

Subject's general information

Subject name	Structures 2
Code	101417
Semester	Second semester
Typology	Compulsory subject
ECTS credits	6
Groups	One large and two medium-sized
Theoretical credits	0
Practical credits	0
Office and hour of attention	1.03 building CREA Schedule previously agreed by email
Department	Enginyeria Agroforestal
Teaching load distribution between lectures and independent student work	60 Master class 90 Homework
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Spanish
Degree	Degree in Architectural Technology
Distribution of credits	20 hours of theory 40 hours exercises
Office and hour of attention	1.03 building CREA Schedule previously agreed by email
E-mail addresses	jmiglesias@eagrof.udl.cat

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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

Learning objectives

Based on the study of beams with different types of supports, made in the course of **Structures 1**, you reach the trusses and frames structures with pin or fixed connections. The subject of **Structures 2** aims to learn how to calculate efforts that appear in this structures, and draw diagrams of the corresponding efforts, as prelude to the design of the section of reinforced concrete (Structures III), of steel or wood (there are no subjects specified for these materials in the curriculum degree).

Competences

University of Lleida strategic competences

- Master Information and Communication Technologies.
- Capacity of analysis and synthesis.
- To have the skills required to undertake new studies or improve the training with self-direction.
- Capacity of abstraction and of critical, logical and mathematical thinking.

Degree-specific competences

- Ability to apply the technical rules to the building process and generate documents of technical specifications of the construction procedures and methods of the buildings.
- Aptitude for the predimensioning, design, calculation and checking of structures and for the direction of their material execution.
- 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.
- Aptitude to apply the specific rules about installations to the building process.

Degree-transversal competences

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

Subject contents

T1.- Types of Structures. Frames and Trusses.

T2.- Analysis of Statically Determinate Trusses

T3.- Analysis of Statically Indeterminate Trusses. Castigliano's Theorem

T4.- Deflections

T5.- Roof Trusses

T6.- Analysis of Statically determinate Frames

T7.- Analysis of Statically Indeterminate Frames

T8.- Matrix calculation of structures

Methodology

It is a theoretical and practical subject. The homework using the recommended bibliography is very important.

The course develops theoretical concepts of each theme and then exercises that complement and facilitate the understanding of matter are done.

Throughout the explanations of the work that is being done, in each session, student must make questions required for complete understanding of the theoretical and practical developed content.

Professor will deliver, at the beginning of each theme, a summary. In any case this material replaces the books recommended for the study of the subject. The student needs a much more comprehensive understanding which can develop in class during an academic course.

This subject must be done when the student have the **Structures 1** basic required concepts.

When the student have the necessary knowledge, the Professor proposes some exercises to do at home or in classroom. Randomly, some are collected and scored (in total 0.50). This note is added at the end of the course. This allows the student self-assessment, and the constant personal work is awarded.

During the sessions in the classroom, teacher raises questions to which every student can answer. The result of this activity is a clear indicator of the level of study and understanding of the matter. It is a valuation of the subject that is very useful, both for the teacher and for the student.

All the issues are interlinked together. This makes impossible that the study of the subject can be done at the end, not serving, in this case, all the class attendance during the course.

Development plan

Dates	Description:	Classroom activity	HTP (2) (Hores)	Personal activity	HTNP (3) (Hores)
	T1.- Types of Structures. Classification of Frames and Trusses	Theory	1	Theory	1,5
	T2.- Analysis of Statically Determinate Trusses	Theory (4) Problems (5)	9	Theory and Problems	13,5
	T3.-Analysis of Statically Indeterminate Trusses. Castigliano's Theorem	Theory (1) Problems (3)	4	Theory and Problems	6
	T4.-Deflections	Theory (1) Problems (1)	2		3
	T5.- Roof Trusses	Theory (2) Problems (2)	4	Theory and Problems	6

Dates	Description:	Classroom activity	HTP (2) (Hores)	Personal activity	HTNP (3) (Hores)
first partial exam	T1-T5	Theory	0.5		
first partial exam	T1-T5	Problems	1.5		
	T6.- Analysis of Statically determinate Frames	Theory (1) Problems (4)	5	Theory and Problems	7,5
	T7.- Analysis of Statically Indeterminate Frames	Theory (4) Problems (11)	15	Theory and Problems	24
	T8.- Matrix calculation of structures	Theory (6) Problems (14)	20	Theory and Problems	30
second partial exam	T6-T8	Theory	0.5	Theory	
second partial exam	T6-T8	Problems	1.5	Problems	
Recovery	RecoveryT1-T8	Theory and Problems	2	Theory and Problems	

(2)HTP = Hores de Treball Presencial

(3)HTNP = Hores de Treball No Presencial

Evaluation

without translate-

Objectives	Evaluation activities	%	Dates	O/V (1)	I/G (2)	Observations
T1-T5	Theory T1-T5	15	first partial exam	O	I	
T1-T5	Problems T1-T5	35	first partial exam	O	I	Without books
T6-T8	Theory T6-T8	15	second partial exam	O	I	
T6-T8	Problems T6-T8	35	second partial exam	O	I	Without books
Recovery	Theory and Problems T1-T8	100	Recovery			Without books
Recovery	For students who have been to all the midterms. Note maximum 5. The note of the examination of recovery, for all the students who submitted, shall be final					

(1)Obligatòria / Voluntària

(2)Individual / Grupal

Bibliography

Recommended bibliography

Análisis estructural

R.C. Hibbeler

Editorial Pearson

Análisis de estructuras. Métodos clásico y matricial

J.McCormac, R.E. Elling

Editorial Alfaomega

Análisis Estructural

A .Kassimali

Editorial Thomson

Análisis matricial de estructuras de barras

J. M^aIglesias

Ediciones de la UdL. Eines16

Programa Barras. Cálculo de estructuras planas

J. M^aIglesias, J. Bradineras

Cuadernos 2. Ediciones de la UdL

Cálculo de Estructuras Tomo I y II

Carlos Jurado Cabañes

Ed. el autor