



Universitat de Lleida

DEGREE CURRICULUM
STRUCTURAL MATERIALS

Coordination: PUIGDOMENECH FRANQUESA, LUIS

Academic year 2023-24

Subject's general information

Subject name	STRUCTURAL MATERIALS			
Code	102578			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Agricultural and Food Engineering	3	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	1	2	3
	Number of groups	1	1	1
Coordination	PUIGDOMENECH FRANQUESA, LUIS			
Department	AGRICULTURAL AND FOREST SCIENCES AND ENGINEERING			
Important information on data processing	Consult this link for more information.			
Language	Català: 100%			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
PUIGDOMENECH FRANQUESA, LUIS	lluis.puigdomenech@udl.cat	6	

Subject's extra information

Subject/matter in the whole degree plan

"Materials Estructurals" is a middle level subject of construction matters in the Rural and Environmental Engineering mention

Compulsary previous subjects: - Construcció (102521)

Learning objectives

Competences

The non-unique solution of problems with different structural materials, the subject promotes the development of the general competence:

CG8. Ability to solve problems with creativity, initiative, methodology and critical reasoning.

The specific competence in the present subject is highlighted in bold:

CEMCR2. Bases and technology of rural buildings. **Soil Mechanics. Materials.** Strength of materials. **Structural design.** Agricultural buildings. Rural infrastructure and roads.

Subject contents

Block 1: The materials

Unit 1. Norms. Denomination and mechanical properties of steel, concrete, timber and soil. Most relevant ULS and SLS of each material

Unit 2. Durability. Standard measures

Unit 3. Quality control. Sampling, evaluation and acceptance methods

Block 2: The processes

Unit 4. Building processes

Unit 5: Unions. Typology considering structural material.

Block 3: The verifications

Unit 6. Verifications on materials. Plasticity. Cracking. Anisotropy. Combined materials

Unit 7. Verifications on structures. Buckling. Deformation. Rheology

Methodology

Development plan

The subject activities will be:

- **Lectures**, some of them (mainly in Environmental Control) will need calculus skill
- Some **activities** (related to visits and lectures), **optional, no scoring weight**
- **Tests** (See Evaluation)
- **Partial exams** (See Evaluation)

Evaluation

- Block 1: Units 1-3; non presencial exam, scoring weight **20%**
- Block 2: Units 4-5; presencial exam, scoring weight **30 %** (scheduled)
- Block 3: Units 6-7; presencial exam, scoring weight **50 %** (scheduled)

Formal correction, good writing, clarity, order and spelling are required in exams. The presence of some fundamental misconception, order of magnitude or contradiction may be sufficient cause for an exam to be classified as suspense. The mathematical expressions will have to be written correctly and the numerical results will be accompanied by units of measurement.

Having failed by partial exams, there would be a final exam for retaking the failed blocks and blocks would be weighted in the same way as partial exams; the maximum obtainable result in this exam would be the most result between - 5,0 - or 0,5 points less than the lowest one obtained by partial exams.

Alternative evaluation: unique exam of the whole content of the matter and at 3rd block exam. In case of failing the exam, there is a retaking exam in the scheduled date.

Bibliography

A) Steel

Mº de Transportes, Movilidad y Agenda Urbana, 2021. Código Estructural

Comisión Permanente de Estructuras de Acero, 2011. Instrucción de acero estructural EAE. Ed. Mº Fomento, 655 pp.

Arnedo A., 2009. Naves industriales con acero. Ed. APTA, 434 pp.

Eurocodi 3, UNE-EN 1993-1-1

B) Timber

Código Técnico de la Edificación, Documento Básico, Seguridad Estructural, Madera (CTE-DB- SE-M) www.codigotecnico.org. Ed. Mº Fomento, 126 pp.

Comité técnico AEN/CTN 140, 2010. Proyecto de estructuras de madera, Eurocódigo 5. Ed. AENOR

Argüelles R., Arriaga F., Martínez J.J., 2000. Estructuras de madera : diseño y cálculo. Ed. AITIM., 730 pp.

Eurocodi 5, UNE-EN 1995-1-1

C) Concrete

Mº de Transportes, Movilidad y Agenda Urbana, 2021. Código Estructural

Código Técnico de la Edificación, Documento Básico, Seguridad Estructural, Cimientos (CTE- DB-SE-C) www.codigotecnico.org. Ed. Mº Fomento, 160 p.

Jiménez Montoya P *et al.* 2009. *Hormigón armado*. 15ª ed. Barcelona: Gustavo Gili, 629 pp. Calavera J., 2008. Proyecto y cálculo de estructuras de hormigón. Ed. Intemac, 2 tomos.

Eurocodi 2, UNE 1992-1-1

D) Soil

Código Técnico de la Edificación, Documento Básico, Seguridad Estructural, Cimientos (CTE- DB-SE-C) www.codigotecnico.org. Ed. Mº Fomento, 160 p.

Guía de Cimentaciones en Obras de Carretera. (GCOC) Mº Fomento. 303 p.D) Sol