



Universitat de Lleida

DEGREE CURRICULUM  
**SYSTEMS AND BUILDING  
TYPOLOGIES**

Academic year 2015-16

## Subject's general information

<b>Subject name</b>	Systems and building typologies
<b>Code</b>	101413
<b>Semester</b>	2n Q Continuous evaluation
<b>Typology</b>	Obligatory
<b>ECTS credits</b>	6
<b>Theoretical credits</b>	4.35
<b>Practical credits</b>	1.65
<b>Department</b>	Enginyeria Agroforestal
<b>Modality</b>	Presencial
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.
<b>Language</b>	Catalan
<b>Degree</b>	Degree in Architectural Technology
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## Subject's extra information

The course develops the usual construction systems in the building: continuous load-bearing walls systems, framing systems and prefabrication systems.

The practical aspect is to solve the student through practices. The subject understands that the freehand drawing is the only way of thinking architectural construction adapted to small and large scale. Freehand drawing is the grammar of technical architect, his way of relation to other professionals involved in building.

## Learning objectives

See competences

## Competences

### University of Lleida strategic competences

- Different systems that can be set in architecture, we're going to work construction systems that characterize the construction of the twentieth century, beginning of XXI, without forgetting functional aspects, spatial and formal, which are associated with building typology.  
A construction system is a set of heterogeneous elements -in different scales of construction materials and properties- which relate to each other with an internal organization that tries to, strategically, to offer a coherent response in front of the complexity of the environment, constituting a whole -a house, a building, an organization - not possible understand it by the simple addition of its parts. Accept the concept of building system has to do with consciousness total interrelationship between elements. Therefore, the regulations and instructions -we need to know and understand- materials, construction details-structure, building systems-structure and building typologies are subsystems that are suggesting larger scale.

### Degree-specific competences

- Knowledge of the historical evolution of construction techniques and elements and of the structural systems which have given rise to the stylistic forms.
- Aptitude to identify the constructive elements and systems, define their function and compatibility, and their use in the construction process. Raise and resolve constructive details
- Knowledge of the specific procedures for controlling the material execution of a building work.
- Knowledge of the evaluation of the environmental impact of the building and demolition processes, of the sustainability in building and of the procedures and techniques to evaluate the energy efficiency of buildings.
- Knowledge of the traditional or prefabricated construction systems used in building, their varieties and the physical and mechanical characteristics which define them.
- Ability to elaborate manuals and maintenance plans and manage their implementation in a building.
- Ability to apportion construction materials to the type and use of the building, manage and direct the reception and quality control of the materials, their use, the execution control of the work units and the realisation of trials and final tests.
- Ability to pass judgement on the causes and manifestations of the lesions in buildings, propose solutions to avoid or repair pathologies, and analyse the useful life cycle of constructive elements and systems.
- Aptitude to intervene in the rehabilitation of buildings and in the restoration and construction of the existing heritage.

### Degree-transversal competences

- Ability to reunite and interpret relevant data, inside an area of study, to express reasons which include reflecting upon relevant subjects of a social, scientific or ethical nature.
- Ability to plan and organise the personal work.
- Ability to consider the socio-economical context as well as the criteria of sustainability in the solutions of engineering.
- Ability to work in situations where information is lacking or you are under pressure.

## Subject contents

### **T1.-Systems continue construction. Ceramic brick walls**

- 1.1.-Technical constructive and architectural form.
- 1.2.-Constructive elements and their articulation. The concept of "closed box".
- 1.3.-Code. CTE-DB-SE-F
- 1.4.-Calculations of masonry walls according to CTE-DB-SE-F
- 1.5.-The Termoarcilla. Criteria for project execution.

### **T2.-Systems building - structural framework**

- 2.1.-Basic geotechnical characteristics of the soil.
- 2.2.-Behaviour of systems building- structural against settlements.
- 2.3.-Foundations surface.
- 2.4.-Foundations deep.
- 2.5.-Old ceilings and current floors.
- 2.6.-Types of slabs.
- 2.7.-Vertical communication cores: stairs and lifts.
- 2.8.-Traditional facades.
- 2.9.-Ventilated facades.
- 2.10.-Continuous surfacing.
- 2.11.-Plain roof.
- 2.11.-Sloped roof.

### **T3.-Systems prefabrication in building**

- 3.1.-Industrialized construction techniques.
- 3.2.- To industrialize the bulk of the building.
- 3.3.-The prefabrication as an alternative to conventional construction of buildings.

## Methodology

See development plans

## Development plan

**T1.-System construction continue. Walls masonry ceramics.**

**T2.-System construction-structural framework.**

**T3.-Systems prefabrication in building.**

### 1st Week

**T1.-**

- Presentation of the subject. Presentation Practice No.1: **Work Notebook**
- Relationship between building techniques and architectural form in buildings masonry ceramics
- The concept of "closed boxes"

### 2nd Week

**T1.-**

- The system construction-structural masonry walls ceramic according to current regulations CTE-DB-SE-F
- Verification of bearing capacity of masonry walls according ceramics DB-SE-F. Example calculation.

### 3rd Week

**T1.-**

- "Termoarcilla". Criteria for project and execution.
- Presentation **Practice No. 2: Redesigning the first two rows of two houses masonry ceramics**

**T2.-**

- Basic geotechnical characteristics of the soil

### 4th Week

**T2.-**

- Behavior of different structural systems in front of settlement of land
- Practice No. 1 partial delivery (Delivery preliminary)
- Surface foundations. Execution and construction

### 5th Week

**T2.-**

- Deep foundations. Execution and construction.
- Slabs.The old slabs and the current slabs.

### 6th Week

**T2.-**

- Current slabs: unidirectional and bidirectional
- Predimensioning floor slabs according to EHE 08
- Delivery **Practice No. 2**

### 7th Week

T2.-

- Vertical elements of communication: stairs and lifts
- Rheological properties of building materials

### 8th Week

T2.-

- CTE-DB-HS1.Humidity. Facades and basement walls
- Presentation **Practice No.3**: Descent of loads and construction details

### 9th Week

- **Evaluation 1**

### 10th Week

T2.-

- The traditional facade
- The ventilated facade

### 11th Week

T2.-

- CTE-DB-HR. Protection against noise. Simplified option.
- CTE-DB-HR. Rehabilitation.
- Delivery **Practice No. 3**

### 12th Week

T2.-

- Continuous surfacing.

### 13th Week

T2.-

- Flat roofs
- Sloping roofs

### 14th Week

T3.-

- The techniques of industrialized construction

### 15th Week

T3.-

- Apartments industrialized. Examples made.
- Delivery **Practice n°1: Work Notebook**

## Evaluation

Evaluation activities	%	Dates
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AV 1. Evaluation 1	40	Week 9
AV 2. Evaluation 2	32,5	Weeks 16 and 17
Practice nº1	20	See development plan
Practice nº2	2,5	See development plan
Practice nº3	5	See development plan
Exam recovery	50	Week 19

### **Guidelines for the evaluation of the course**

- The subject is approved with final 5

### **Note exams:**

In weeks 9 and 16 / 17a are made evaluation tests programmed (written exams) AV1 and AV2. The test AV1 has a weight of 40% and the test AV2 has a weight of 32.5% of the final grade for the course.

- Practices No. 1, No. 2 and No. 3 are obligatory and have a weight of 27.5% compared to the final of the subject.
- Failure of a practice or its delivery out of time -without notice due justificada- 0 leads in practice accordingly.
- Evaluations do not eliminate material covered.
- Following the guidelines of the Framework Academic Degrees of EPS in the 19th week can be recovered subject.
- Recovery is an independent examination. No longer keep any note of the continuous evaluation. The maximum score is 5.

Unrealized or suspended practices can not be delivered or retrieved during the week of planned recovery.

## Bibliography

Recommended bibliography

### ***About the building system and architectural***

- BENAVENT, Pere; Cómo debo construir (1939). Bosch Editorial. Barcelona. 1993
- PARICIO, Antoni; Secrets d'un sistema constructiu: L'Eixample. Edicions UPC. Barcelona. 2001
- ROWE, Colin; "Chicago Frame", The Mathematics of the Ideal Villa and Others Essays.

Cambridge, Massachussets and London, England. The MIT Press (1976). Traducció castellana, "La estructura de Chicago". Ediciones del Serbal. Barcelona. 1993.

### ***About the constructive elements of the building***

- MAÑA, F; El gros de l'obra. Uns apunts de construcció. Edicions UPC. Barcelona. 2000
- ADELL, J.Mª; Arquitectura sin fisuras. Munilla-Leria. Madrid. 2000
- AAVV; Tratado de construcción. Fachadas y cubiertas (I). Munilla-Leria. Madrid. 2002
- AAVV; Tratado de construcción. Fachadas y cubiertas (II). Munilla-Leria. Madrid. 2002
- PARICIO, Ignacio; La construcción de la arquitectura. Tres volums: Las técnicas; Los elementos; La composición. ITEC. Barcelona. 2000.

- GONZALEZ, J; CASALS, A; FALCONES, A; Les claus per a construir l'arquitectura. Tres volums: I Principis; II Elements; III Elements. Gustavo Gili. Barcelona.2002.
- PARICIO, Ignacio; La fachada de ladrillo. Bisagra.ITEC. Barcelona. 1998.
- BIELZADE ORY, J. Manuel; Revestimientos continuos. Fundación Escuela de la Edificación. Madrid.1996.

***About construction details***

- ALCALDE, F; Banco de detalles arquitectónicos. Distribuidora Díaz de Santos, SA.Sevilla. 2003.
- PERMANYER, Eduard; El detall constructiu a la pràctica de la professió. Publicacions del Col·legi Oficial d'Arquitectes de Catalunya. Barcelona. 1981.