Course guide
310757 - 310757 - Traditional Materials and Techniques

Last modified: 18/10/2023

Unit in charge: Barcelona School of Building Construction
Teaching unit: 753 - TA - Department of Architectural Technology.

Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2019). (Optional subject).

Academic year: 2023 **ECTS Credits:** 3.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Judit Ramírez-Casas

Others: Belén González Sánchez
Antònia Navarro Ezquerra
Antoni Pidemunt Molí
Judit Ramírez-Casas
Edgar Segués Aguasca

PRIOR SKILLS

To successfully achieve the knowledge of this optional subject, it will be essential to have taken and passed the materials subjects; Fonaments de materials, chemistry and geology, Petris Materials and Non-Petris Materials and Construction; the Introducció a la construcció and the Workshop 1- learning from traditional construction.

TEACHING METHODOLOGY

The course is based on theoretical sessions of general knowledge of traditional techniques and materials but sufficiently detailed to know how to identify them in the built heritage. The theoretical classes will be combined with practical classes in the form of visits to existing buildings, street routes and practices in the laboratory to help in the understanding of the identification of the subjects dealt with in class. Video sessions, lectures by experts and practical classes are planned.

LEARNING OBJECTIVES OF THE SUBJECT

Within the framework of EPSEB's most recent guidelines and with the recently launched curriculum, focused on intensifying learning and specialisation in intervention in built heritage, it has been deemed convenient and essential to be able to offer students in the final years of their studies, a complement in the knowledge of traditional materials and techniques that are difficult to include in the contents of the core subjects. Different experts from each of the themes and subjects will take part in the course in order to provide some insight into traditional production systems and showcase examples from the field.

STUDY LOAD

Type	Hours	Percentage
Hours large group	30,0	40.00
Self study	45,0	60.00

Total learning time: 75 h

CONTENTS

Topic 1.- Introduction to traditional materials and construction techniques

Description:
Introduction to traditional architecture and construction. What are traditional techniques? Temporality in traditionality. Different areas, different techniques, different times. Building with local materials.
Types of traditional materials. Our environment.

Related activities:
Recognition of our environment. Different territories, different materials and techniques. Identification of the different materials and traditional techniques listed in class. Exposure of the coursework heading.

Full-or-part-time: 4h
Theory classes: 2h
Guided activities: 2h

Topic 2.- Building with earth

Description:
The territory, the climate and other conditioning factors of the earthen building area. Knowing the earth as a building material. History and examples of earthen constructions. Construction techniques: tapia, adobe, bahareque, cob, Btc, superadobe, prefabricated. Roofs, enclosures, pavements and coverings made with earth.

Full-or-part-time: 4h
Theory classes: 2h
Practical classes: 2h

Topic 3.- Traditional binders and conglomerates

Description:
What are traditional binders? Lime, plasters, mortars and traditional concretes. Where do we find them? Masonry walls and foundations. Cladding, flooring and ornamentation.
Architecture with plaster is abundant in our territory, but very unknown. The use of traditional plaster in different construction systems will be analysed, going deeper into the most significant traditional construction techniques by means of real examples. We will learn to identify plaster in buildings and to distinguish it from lime.

Full-or-part-time: 4h
Theory classes: 4h

Topic 4.- Coverings

Description:
Origins and history of coatings. The artistic expression of the coatings. Continuous and discontinuous coatings.
Continuous: "Escardejats", plasters and coatings. Glazing and whitewashing. Stuccoes: smooth, scraped, Tyrolean, bush hammered, sgraffito, marble. Paintings, papers and textiles.
Discontinuous: ceramic, stoneware, hydraulic tiles.

Full-or-part-time: 8h
Theory classes: 4h
Guided activities: 4h

Topic 5.- Arches and vaults as structural forms. Types and materials.

Description:
The vault as an architectural structure to cover spaces. The role of the vaults throughout history. The construction materials for vaults: stone, ceramics and conglomerating materials. Types of vaults. The particular case of the Catalan vault. The dome.
The arch as a linear structural element with a curved guideline. Materials for the construction of the arches. Types of arches. How arches and vaults work.

Full-or-part-time: 2h
Theory classes: 2h

Topic 6.- Traditional construction with wood. Structure, enclosures and finishes

Description:
Wood as a building material, properties and singularities. Methods of obtaining, most common species used traditionally. Uses and applications in traditional construction. Methods of identification, diagnosis and assessment of its state of conservation.

Full-or-part-time: 2h
Theory classes: 2h

Topic 7.- Foundry and forging elements

Description:
The main iron alloys used in traditional construction. Knowledge of its most practical side and experimentation with samples of some of them. Classification according to their composition, weldability, fields of use and most common construction typologies. Techniques and tools for their identification and knowledge of their properties. 19th century iron architecture.

Full-or-part-time: 2h
Theory classes: 2h

GRADING SYSTEM

I work with continuous evaluation.
NO EXAMS WILL BE PERFORMED.

EXAMINATION RULES.

Depending on the number of students and the topics chosen for the work by the students, it may be done in groups.

BIBLIOGRAPHY

Basic:
- Minke, Gernot. Manual de construcción en tierra : la tierra como material de construcción y su aplicación en la arquitectura tradicional. Montevideo: Nordan-Comunidad, DL 2001. ISBN 9974493471.
- Mateu Subirà, Joaquim. Fargues de Catalunya i Andorra. Barcelona: Rafel Dalmau, 2004. ISBN 842320670X.
- La Spina, V.. Estudio del yeso tradicional en España. Yacimientos, canteras, hornos y la arquitectura tradicional, su estado de conservación y propuestas de itinerarios visitables para su revalorización y difusión. Fase II [on line]. Cartagena, 2016Available on: http://www.culturaydeporte.gob.es/planes-nacionales/dam/jcr:26b566fa-f65d-4e8c-a0fe-ce486ba47060/estudio-del-yeso-tradicional-en-espa-a-fase-2.pdf.
- Nou llibre.
- Varies autors. Arquitectura tradicional. Essència o forma. Un debat obert al voltant de la intervenció a l'arquitectura vernacla [on line]. Barcelona: F12 serveis editorials, 2016 [Consultation: 20/01/2021]. Available on: https://dialnet.unirioja.es/servlet/libro?codigo=695303. ISBN 9789892059099.
- Marín Sánchez, R.. Uso estructural de prefabricados de yeso en la arquitectura levantina de los siglos XV y XVI [Tesis doctoral] [on line]. Valencia: Editorial Universitaria de València, 2014Available on: https://riunet.upv.es/handle/10251/47459.
- Plan nacional de arquitectura tradicional [on line]. Madrid: Ministerio de Cultura y Deporte - Gobierno de España, 2015 [Consultation: 20/01/2021]. Available on: http://www.culturaydeporte.gob.es/planes-nacionales/planes-nacionales/arquitectura-tradicional.html.
- Usedo Valles, Rafael Manuel. Estudio y análisis de la utilización de la cal para el patrimonio arquitectónico [on line]. Primera. Valencia: Universitat Politècnica de València. Escuela Técnica Superior de Arquitectura - Escola Tècnica Superior d'Arquitectura, 2015 [Consultation: 20/01/2021]. Available on: http://hdl.handle.net/10251/60200.

Complementary:
- Gárate Rojas, Ignacio. Artes de la cal. 2ª ed. Madrid: Munilla-Lería, 2002. ISBN 9788489150508.