

Course guide

310726 - 310726 - Construction of Envelopes and Finishes

Last modified: 03/07/2024

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).
(Compulsory subject).

Academic year: 2024 **ECTS Credits:** 4.5 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Paris Viviana, Oriol

Others: Capellà Llovera, Joaquin
Paris Viviana, Oriol

PRIOR SKILLS

Graphic expression.
Written expression.
Oral expression.

REQUIREMENTS

It is highly recommended to have passed the subjects of Construcció I-II-III.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.
2. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.

Transversal:

3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.
4. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
5. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
6. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
7. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

TEACHING METHODOLOGY

Methodology based on a learning focused on the student (the active involvement of the student in all the process implicates a development of the self-learning and self-evaluation abilities of reasoning):

The learning of modules of objectives. The purpose of this method is to make easier to the student the global comprehension of the different knowledges which are in some way related between them and which form the course list of topics.

The learning based in problems (ABP), in this case the student sets out a problem which for its resolution it is necessary to acquire all the required competences and knowledge.

The directed learning hours consist on the one hand in teaching theoretical classes (big group) where the professor does a brief exposition to introduce the general learning objectives related with the basic concepts of the subject. Subsequently and by means of practical exercises, the professor motivates and involves the students so that they can participate actively in their own learning. It is used support material in detailed teaching plan by ATENEA: learning objectives by contents, concepts, examples, evaluation activities and directed learning schedules and bibliography.

On the other hand, the directed learning hours also consist on teaching practical classes (medium group) where the students generally work in work groups of 3 members, by the resolution of exercises related with the specific learning objectives of each one of the contents of the subject.

Most of these practical sessions incorporate generic competences. Therefore cooperative learning techniques are developed at class.

Generally, after each theory session out of class tasks are proposed, which must be worked individually or in groups.

This teaching methodology is planned for a maximum of 50-55 students.

LEARNING OBJECTIVES OF THE SUBJECT

It is intended that the student acquire their own intellectual tools so as to be able to diagnose the type of envelope and finish and the most appropriate construction technologies according to functionality, architecture and place.

The course aims, mainly, to establish the bases of the exchange of energy, matter and information through the envelope and the different interior spaces of the building, as well as to provide the criteria and analysis to determine the appropriate envelope and the interior space of the building in function of its benefits and its environmental responsibility. The correlation of expiring to non-expiring insights is 40/60.

At the end of the course, the student must be able to:

Determine an appropriate technology and prioritize the selection criteria

Explain the meaning of a technologically correct surround system according to use and location, as well as the separation systems of the different interior spaces. Relate and assess the suitability of the façade and the interior space according to the CTE

- Define an enclosure based on the climatic and use preexistence and the interior space according to the different uses attached to it.
- Identify the different envelope systems and their problems. Identify the different interior uses and specify their impermeability or opacity with the different annexed spaces.
- Use the hygrothermal, technological and scientific concepts to specify an enveloping system, as well as the requirements of the different interior spaces

Identify, classify and choose the suitability of the different construction elements that make up the distribution and communication systems inside a building as well as the coatings that provide the finish.

STUDY LOAD

Type	Hours	Percentage
Hours medium group	18,0	16.00
Hours large group	27,0	24.00
Self study	67,5	60.00

Total learning time: 112.5 h

CONTENTS

MODULE 1: THE ENVELOPE. CLIMATE AND ENERGY REGULATOR

Description:

In this content we work:

Hygrothermal Concepts and Parameters

The envelope and the interior space as a regulator:

1. Acoustic
2. Thermal
3. Light
4. Climate

The indoor climate

Roof and Facade a solution of continuity.

Specific objectives:

Knowledge of the fundamentals and principles applied to building, hygrothermia, acoustics, and light.

Related activities:

Partial Exam

Related competencies :

FE-04. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.

FE-07. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.

07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

02 SCS N2. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

Full-or-part-time: 16h 53m

Theory classes: 4h 03m

Practical classes: 10h 08m

Self study : 2h 42m

MODULE 2: THE ENCLOSURE FAÇADES. TYPOLOGIES, SYSTEMS AND deconstruction

Description:

This content works on:

Criteria and classification Façades

Functional Systems.

Construction Systems.

Ceramic and masonry

Structural Systems.

Lattice Systems and Panel Systems

Types of construction

Types of assembly

Deconstruction

Specific objectives:

Knowledge of the specific procedures for the control of the material execution of the building work.

Related activities:

Examen Parcial

Related competencies :

FE-04. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.

FE-07. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.

05 TEQ N2. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

02 SCS N2. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

Full-or-part-time: 39h 23m

Theory classes: 6h 18m

Practical classes: 9h 27m

Self study : 23h 38m

MODULE 3: THE ROOF ENVELOPE. TYPES, SYSTEMS AND DECONSTRUCTION

Description:

This content works on:

The construction types of the main roof systems and their suitability according to pre-existing conditions and requirements

- Conventional roof
- Inverted roof
- Light roof
- Garden roof
- Roof Aljub

Related activities:

Final Exam

Related competencies :

FE-04. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.

FE-07. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.

04 COE N2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

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Full-or-part-time: 39h 23m

Theory classes: 6h 18m

Practical classes: 23h 38m

Self study : 9h 27m

MODULE 4 PARTITIONS and FINISHES

Description:

The classification of the finishing systems into three large groups: horizontal, vertical and ceiling surfaces. All three receive the attacks typical of the use to which they are intended.

The three groups have to provide a light, acoustic and thermal and functional environment that requires a formal, textural and pictorial aspect of its own that will end up determining the constructive solutions to be adopted.

Specific objectives:

1. Interpret and apply the performance requirements of floor coverings.
2. Interpret and apply the performance requirements of wall coverings.
3. Interpret and apply the performance requirements of roof coatings.
4. Justify and apply the functional and constructive typologies of the cladding, walls and ceilings.
5. Choose the suitability of the different functional and constructive types of floors, walls and ceilings.

Related activities:

Final Exam

Related competencies :

FE-04. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.

FE-07. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.

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Full-or-part-time: 16h 53m

Theory classes: 4h 03m

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Self study : 2h 42m

ACTIVITIES

ACTIVITY 1. CASE ANALYSIS

Description:

Resolution of the exercise in a group of students between 3 and 4 that is given at the end of the year. A case study will be analyzed that can be both a building and a construction system. The analysis will be in depth since the activity will be carried out from the first day of class and requires independent work of about 4 hours a week
Represents part of the 20% continuous assessment

Specific objectives:

At the end of the activity, the student should be able to:

1. Define an envelope based on the preexistence of weather and use
2. Diagnose a technologically correct envelope according to use and location.
3. Assess the suitability of the façade

Material:

class notes

Related competencies :

FE-04. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.

07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

02 SCS N2. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

Full-or-part-time: 63h 20m

Practical classes: 63h 20m

GRADING SYSTEM

The continuous assessment consists of different activities of a summative and formative nature, carried out during the course (inside and outside the classroom).

Directed Activity - 20%

There will also be two partial exams and a final one with the following percentages (the exams will be done without reference material)

Partial 1 - 25%

Partial 2 - 25%

final - 30%

NO RE-EVALUATION EXAM

EXAMINATION RULES.

All tests will be done WITHOUT the reference material used throughout the course.

BIBLIOGRAPHY

Basic:

- Tectónica. 14. Acústica. Madrid: ATC ediciones,
- Monjo Carrió, Juan ... [et al.]. Tratado de construcción: sistemas. Madrid: Munilla-Lería, 2002.
- Asociación Española de Fabricantes de Fachadas Ligeras y Ventanas. Manual de producto : fachadas ligeras. Barcelona: Tecnopress, 2015. ISBN 978-84-939023-1-5.
- González Moreno-Navarro, José Luis. Les Claus per a construir l'arquitectura. 2a ed. Barcelona: Generalitat de Catalunya, Departament de Política Territorial i Obres Públiques : Gustavo Gili, 2009.
- Paricio Ansuategui, Ignacio. La Construcción de la arquitectura. 1. Las técnicas. 4a ed. Barcelona: ITEC, 1999.
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- CTE : código técnico edificación. Madrid: Cepreven, 2006. ISBN 8485597982.
- Sastre i Sastre, Ramon. Propietats dels materials i elements de construcció [on line]. Barcelona: Edicions UPC, 2000 [Consultation: 13/06/2013]. Available on: <http://hdl.handle.net/2099.3/36307>. ISBN 848301422X.
- Paricio Ansuategui, Ignacio. El Vidrio estructural. Barcelona: Bisagra, 2000. ISBN 8493132020.
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- Abásolo, A ... [et al.]. Tratado de rehabilitación. Vol 4. Patología y técnicas de intervención: fachadas y cubiertas. MADRID: Universidad Politécnica de Madrid. Departamento de Construcción y Tecnologías Arquitectónicas, 1998-1999. ISBN 8489150265.
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- Bernard, Paul. La Construcción por componentes compatibles. Barcelona: Editores Técnicos Asociados, 1983. ISBN 8471462346.
- París Viviana, Oriol. Un Material per imaginar : innovació i singularitat en les façanes de formigó d'Escofet. Barcelona: Escofet 1886, 2023. ISBN 9788409500321.
- Fachadas ligeras, manual de producto. Nueva edición actualizada. Molins de Rei (Barcelona): Interempresas Media, marzo 2022. ISBN 9788412451016.

RESOURCES

Other resources:

Normative:

Technical Code in Construction

SU Safety of use

DB HS Salubrity

DB HE Energy save

DB SI Security in case of fire

DB HR Noise protection

Decree 259/2003 of 21 October, about the minimum habitability requirements in housing buildings and the habitability certificate (DOGC no. 3999, 30 October of 2003)

Decree 135/1995 Accessibility code of Catalonia