

Course guide

310022 - 310022 - Construction IV

Last modified: 23/04/2020

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

Degree: **Academic year:** 2020 **ECTS Credits:** 6.0
Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: ANTONIO CABALLERO MESTRES

Others: Oriol Paris Viviana
Manuel Rodriguez Rocandio

Alfaro Garrido, Licinio José

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.
3. FE-8 Knowledge of specific procedures for the material execution control of the construction.
4. FB-5 Knowledge of the theoretical basis and the basic principles applied to the construction, of the fluid mechanics, the hydraulics, the electricity and electromagnetism, the calorimetry and thermal comfort, and the acoustics.

Transversal:

5. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.
6. 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.
7. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
8. 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.
9. 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

Theoretical classes, practices and tutorials.

LEARNING OBJECTIVES OF THE SUBJECT

It is pretended that the student achieve individual mental tools like diagnose the type of surroundings and the most suitable construction technologies according to the functionality, architecture and place.

The subject pretends, mainly, to establish the basis of energy, mass and information exchange through the building surrounding, as well as provide the criteria and analysis to determine the appropriate surrounding of the building depending on its outputs and its environmental responsibility. The correlation between the expired knowledge and the non-expired knowledge is 40/60.

At the end of the subject, the students should be able to:

- . Determine the appropriate technology and organize the selection criteria.
- . Explain the meaning of a technologically correct surrounding system according the use and location. Connect and value the aptitude of the façade according to the CTE.
- . Define a surrounding according to the climatic and use existences.
- . Identify the different surrounding systems and its difficulties.
- . Use the thermal, technological and scientific concepts to set a surrounding system.

STUDY LOAD

| Type | Hours | Percentage |
|--------------------|-------|------------|
| Hours large group | 36,0 | 24.00 |
| Self study | 90,0 | 60.00 |
| Hours medium group | 9,0 | 6.00 |
| Guided activities | 15,0 | 10.00 |

Total learning time: 150 h

CONTENTS

Content 1: ENVELOPE AS A REGULATOR OF COMFORT

Description:

In this content the students work:

Thermal concepts and parameters.

The surrounding as regulator:

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

Roof and façade as a continuous solution.

Energy efficiency.

Related activities:

There will be done the activity 1.

Full-or-part-time: 45h

Theory classes: 11h

Practical classes: 4h

Guided activities: 3h

Self study : 27h

Content 2: ENVELOPE TIPOLOGIES AND SYSTEMS

Description:

In this content the students work:

Classification and standards according to functional and constructive systems.

Framework systems and panel systems.

Construction typologies.

Output and environmental analysis of the typologies.

Related activities:

There will be done the activity 2.

Full-or-part-time: 44h 30m

Theory classes: 10h 30m

Practical classes: 3h

Guided activities: 4h

Self study : 27h

Contingut 3: SUSTAINABLE AND BENEFICIAL ENVELOPE

Description:

In this content the students work:

Optimization of the comfort systems depending on the use:

1. Acoustic.

2. Thermal.

3. Light.

4. Climatic.

Environmental co-responsibility:

1. Local materials.

2. Energy cost transportation.

3. Energy and emission valuation.

Industrialization.

Clientalization.

Assembly and dismantling criteria. Change of façade.

Related activities:

There will be done the activity 3.

Full-or-part-time: 30h

Theory classes: 7h

Practical classes: 2h

Guided activities: 3h

Self study : 18h

Content 4: SYSTEMS / MATERIALS / DESCONSTRUCTION

Description:

In this content the students work:

Structural criteria.

Constructive criteria.

Geometric criteria.

Construction process criteria.

Related activities:

There will be done the activity 4.

Full-or-part-time: 30h 30m

Theory classes: 7h 30m

Practical classes: 3h

Guided activities: 2h

Self study : 18h

ACTIVITIES

INDIVIDUAL TEST OF CONTINUOUS EVALUATION

Description:

Individual realization at class of an exercise about the topic EVOLVENT COM A REGULADOR DEL CONFORT which covers all the specific learning objectives of the topic, with a wording related with some matter of environmental or quotidian life interest.

Correction by the faculty.

Specific objectives:

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

1. Define a surrounding depending on the climatic and use existences.
2. Diagnose a technologically correct surrounding according to the use and location.
3. Value the aptitude of the façade.

Material:

Self-learning series with multiple choice and notes of the contents available (PowerPoint) in ATENEA.

Following official resolution with correction criteria (rúbrica) available by the virtual campus ATENEA.

Delivery:

Resolution of the exercise by the student. The professor will give it back corrected the next week, so that the students can compare it with the official resolution. It represents a part of the continuous evaluation (30%).

Full-or-part-time: 3h

Self study: 2h

Practical classes: 1h

GROUP TESTS OF CONTINUOUS EVALUATION

Description:

In groups of 3 to 4 members and at class, the students do an exercise at the end of the topic ENVOLVENT TIPOLOGIES I SISTEMES with a wording related with some matter of environmental interest and where is necessary to apply most of the specific learning objectives of the topic. Afterwards there will be done a co-evaluation between groups, with the help of a table with the correction criteria (rúbrica), while the faculty corrects the exercise on the board.

Specific objectives:

At the end of the activity the students should be able to:

- 1.- Know the current construction systems.
- 2.- Control the hermeneutics of the current systems according to new standards.
- 3.- Analyze the pros and cons of a typology and a system depending on a construction process.
- 4.- Regulation demands.

Material:

Self-learning questionnaire with multiple choice and notes of the contents (PowerPoint) available in ATENEA.

Delivery:

Exercise of each one of the group members with the corresponding co-evaluation and the common report of the group. Return, with the corresponding feedback by the faculty, in the next session and general reflection at class about the most common mistakes and the associated learning objectives which should be reinforced. It represents a part of the continuous evaluation 25%.

Full-or-part-time: 3h

Self study: 2h

Practical classes: 1h

INDIVIDUAL TESTS OF CONTINUOUS EVALUATION

Description:

Individual realization at class of an exercise about the topic EVOLVENT SOSTENIBLE I PRESTACIONAL which covers all the specific learning objectives of the topic, with a wording related with some matter of environmental or quotidian life interest. Correction by the faculty.

Specific objectives:

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

1. Value technologically the form and the space.
2. Quantify to the first level the environmental cost.
3. Diagnose a technology which allows the change of façade.

Material:

Self-learning series with multiple choice and notes of the contents available (PowerPoint) in ATENEA. Following official resolution with correction criteria (rúbrica) available by the virtual campus ATENEA.

Delivery:

Resolution of the exercise by the student. The professor will give it back corrected the next week, so that the students can compare it with the official resolution. It represents a part of the continuous evaluation (20%).

Full-or-part-time: 3h

Self study: 2h

Practical classes: 1h

GROUP TESTS OF CONTINUOUS EVALUATION

Description:

In groups of 3 to 4 members and at class, the students do an exercise at the end of the topic SISTEMES MATERIALS DESCONSTRUCCIO with a wording related with some matter of environmental interest and where is necessary to apply most of the specific learning objectives of the topic. Afterwards there will be done a co-evaluation between groups, with the help of a table with the correction criteria (rúbrica), while the faculty corrects the exercise on the board.

Specific objectives:

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

1. Diagnose an appropriate technology.
2. Organise the selection criteria.
3. Offer possibilities which answer to a more suitable alternative according to current technologies and processes.

Material:

Self-learning questionnaire with multiple choice and notes of the contents (PowerPoint) available in ATENEA.

Delivery:

Exercise of each one of the group members with the corresponding co-evaluation and the common report of the group. Return, with the corresponding feedback by the faculty, in the next session and general reflection at class about the most common mistakes and the associated learning objectives which should be reinforced. It represents a part of the continuous evaluation 25%.

Full-or-part-time: 3h

Self study: 2h

Practical classes: 1h

GRADING SYSTEM

As the evaluation is continuous, each module is considered with its own evaluation and the following percentage:

Module 1: 25%

Module 2: 25%

Module 3: 25%

Module 4: 25%

EXAMINATION RULES.

All the activities will be done with all the reference material used during the course.

BIBLIOGRAPHY

Basic:

- Asociación Española de Fabricantes de Fachadas Ligeras y Ventanas. Manual de producto : fachadas ligeras. Madrid: ASEFAVE, 2015. ISBN 978-84-939023-1-5.
- Sastre Sastre, Ramon. Propietats dels materials i elements de construcció [on line]. Barcelona: Edicions UPC, 2000 [Consultation: 18/05/2017]. Available on: <http://hdl.handle.net/2099.3/36307>. ISBN 848301422X.
- Paricio Ansuategui, Ignacio. El Vidrio estructural. Barcelona: Ed. Bisagra, 2000.
- Paricio Ansuategui, Ignacio. Las Claraboyas. 3a ed. Barcelona: Ed. Bisagra, 2000.
- 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.
- Kaltenbach, F. Materiales traslúcidos : vidrio, plástico, metal. Barcelona: Ed. Gustavo Gili, 2007.
- Reichel, A. ; Hochberg, A. ; Köpke, C. Enlucidos, revocos, pinturas y recubrimientos : detalles, productos, ejemplos. Barcelona: Gustavo Gili, 2007.
- Hugues, T. ; Steiger, L. ; Weber, J. Piedra natural : tipos de piedra, detalles, ejemplos. Barcelona: Gustavo Gili, 2008.
- Paricio Ansuategui, Ignacio. La Construcción de la arquitectura. 4a ed. Barcelona: Institut de Tecnologia de la Construcció, 1999.

RESOURCES

Other resources:

Other resources:

Articles from different magazines accessible on University campus.

Audiovisual material

Informatics material

Web pages:

www.icaen.es

www.idae.es

www.iea.org

www.upc.es