1. BASIC INFORMATION

Course	Construction 4: Envelopes
Degree program	Bachelor´s in the Fundamentals of Architecture
School	Architecture, Engineering and Design
Year	Fourth
ECTS	6 ECTS
Credit type	Compulsory
Language(s)	English
Delivery mode	Face to face
Semester	1thS
Academic year	2025/2026
Coordinating professor	Susana Moreno Soriano

2. PRESENTATION

Construction IV - Envelopes is compulsory course in the degree program, Fundamentals of Architecture. It is included in the Technical Module: construction, structure, and installations. This is the fourth course in the field of construction with 6 ECTS.

The aim of the course is to explore more in depth the specifics of construction, acquiring the skills to design and detail building envelopes and partitions, such as façades and roofs as a whole skin, which stand out for their architectural and technical complexity.

The course covers a wide variety of façades and roof typologies, introducing concepts and analysing singular elements in specific lessons, and practicing with case studies of projects that represent the current practice and advances in architectural and technical. It covers construction technics and assembling process of the systems.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- CB1: That students have demonstrated knowledge and understanding in a field of study that is based on general secondary education, at a level which, although supported by advanced textbooks, imply some knowledge of the latest advances in their field of study.
- CB2: That students can apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defence of arguments and the resolution of problems within their area of study.

- CB3: That students have ability to gather and interpret relevant data (usually within their field of study) to make judgements that include reflection on relevant social, scientific, or ethical issues.
- CB4: That students can communicate information, ideas, problems, and solutions to both the specialist and non-specialist.
- CB5: That students have developed the necessary learning skills to undertake further studies with a high level of autonomy.
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General competencies:

- CG4: Understanding of the structural design, construction and engineering problems associated with building design;
- CG5: Knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against climatic factors;
- CG6: Knowledge of the industries, organisations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning.
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Cross curricular competencies:

- CT1: Responsibility: aptitude or capacity to face responsibility that the profession of architect has in society, particularly when elaborating projects that take into consideration social and environmental factors.
- CT2: Self-confidence.
- CT3: Awareness of ethical values: ethical commitment, which includes the understanding and knowledge of the rights and duties of individuals and professional people, fostering respect for human rights, the protection of the most vulnerable members of society and respect for the environment.
- CT4: Communication skills in the native language (both oral and written) and in the English language, in accordance with the principles of the Universidad Europea de Madrid, any concept or specification for the development of the regulated profession of architect. This includes learning the specific vocabulary of the degree as well as the ability to manage information.
- CT5: Interpersonal skills.
- CT6: Flexibility
- CT7: Teamwork: ability to work in teams of architects, or in interdisciplinary teams (with shared responsibility in many cases), managing and planning work groups that are necessary in the scheme of competences and tasks that are defined for projects of a certain scale, in which several disciplines converge. This ability includes skills for interpersonal relations and team leadership.
- CT8 Initiative and the spirit of an entrepreneur, both in the area of architecture as well as in business.
- CT9: Planning and time management: ability to plan work in order to comply with delivery times and to respect the limits imposed by budgets and building codes.
- CT10: Innovation and creativity: creativity, imagination and aesthetic sensitivity applied to the design in order to satisfy both the aesthetic and technical demands. This competence includes critical reasoning and historical culture.

Specific competencies:

- CE13: Ability to apply technical and construction standards and regulations.
- CE15: Ability to maintain finished work.
- CE16: Ability to evaluate construction works.
- CE19: Ability to conceive, calculate, design, integrate in buildings and urban units and execute exterior walls and cladding, roofing and other structural work.
- CE31: Knowledge of measurement, assessment and survey methods.
- CE32: Knowledge of the on-site health and safety plan.
- CE39: Ability to design, put into practice and develop site management.

Learning outcomes:

- LO1: Applies technical standards to the construction process, produces documents on the technical specifications of the construction procedures and building methods.

- LO2: Has knowledge of elements, materials and construction methods that make up the building envelope.
- LO3: Has the skills to exercise the profession in any of its forms within the appropriate organisational and regulatory framework.
- LO4: Has the skills to analyse building envelope systems reflected in projects and their translation to the implementation of the works.
- LO5: Has the skills to be critical and creative integrating the different envelope construction systems resulting from the knowledge of construction as an experimental process.
- LO6: Has the skills to programme and organise envelop construction processes, the technical and human resources for their execution and maintenance.
- LO7: Adopts attitudes for conceiving, calculating, designing, integrating interior divisions, carpentry, stairs and other finished work in buildings and urban units with exterior walls, roofing and other structural work.
- LO8: Has the skills to communicate and present solutions and graphic details integrating the different construction systems and the building envelope systems.

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

Competencies	Learning outcomes
CB3, CG5, CE39	LO1 Applies technical standards to the construction process, produces documents on the technical specifications of the construction procedures and building methods.
CB1, CG4, CG5, CE19	LO2 Has the knowledge of elements, materials and construction methods that make up the building envelope.
CB2, CG5, CG6, CT4, CT5, CT8, CE13, CE16, CE31	LO3 Has the skills to exercise the profession in any of its forms within the appropriate organisational and regulatory framework.
CB2, CG4, CT9, CE31, CE39	LO4 Has the skills to analyse building envelope systems reflected in projects and their translation to the implementation of the works.
CG4, CT1, CT2, CT8, CT10	LO5 Has the skills to be critical and creative integrating the different envelope construction systems resulting from the knowledge of construction as an experimental process.
CB5, CT1, CT5, CT6, CT7, CE16, CE19	LO6 Has the skills to programme and organise envelop construction processes, the technical and human resources for their execution and maintenance.
	LO7 Adopt attitudes for conceiving, calculating, designing, integrating interior divisions, carpentry, stairs and other finished work in buildings and urban units with exterior walls, roofing and other structural work.
CB2, CB4, CT2, CT4, CT6	LO8 Has the skills to communicate and present solutions and graphic details integrating the different construction systems and the building envelope systems

4. CONTENT

UA1 o UA3. Envelopes theory. Master classes

UNIT 1 Introduction to building envelope systems

Topic 1. Envelope functions and performances

Topic 2. Façades and roofs. Concepts.

Topic 3. Ground contact. Basement walls and floors

UNIT 2 – Heavyweight solutions

Topic 1. Heavy Roofs.

Flat roofs. Accessible and not accessible. Ventilated and non-ventilated. Traditional and inverted. Green and cistern deck.

Topic 2. Façades 1. Heavy façades made in situ.

Block, brick, and concrete. Single or multi layer, heavy façades, and partitions.

Topic 3. Openings 1. Windows.

Topic 4. Heavy façades. Precast and in situ.

UNIT 3 – Light solutions

Topic 1. Light Roofs

Pitched roof. Flat roof decks. Waterproof deck, metal cladding, tiles, and artificial materials.

Topic 2. Lightweight façades.

Light timber frames. Light steel frames. Sheet metal panels.

Topic 3. Openings in light solutions. Window frames.

Topic 4. Curtain walls.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Lectures.
- Problem based learning.
- Team work.
- Independant study/work.
- Project based learning.

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one and the course policy about artificial AI in that activity:

Campus-based mode:

Learning activity	Number of hours	IA use
Lectures	25h	Allowed
Problem / Project based learning	50h	Promote in research not allow in development
Team work	12,5h	Promote in research not allow in development
Independent study/work	37,5h	Allowed

Tutorials, academic monitoring and assessment	25h	Not allowed
TOTAL	**150h**	

Further details about AI-use policy will be published through the virtual campus platform once the course started

Online mode:

The modality is not taught

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight
Case study / Process	25%
Case study / Project	25%
Exams	40%
Reports and Portfolio	10%

Online mode:

The modality is not taught.

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period

To pass the course in the first exam period, you must obtain a final course grade of at least 5 out of 10 (weighted average, minimum partial grade 4).

The subject is organized on the basis of a continuous evaluation, applied to the assessable parameters that set the training activities of the subject and the tasks entrusted to the student: Individual assignments of practical application of theory, Individual research assignments, individual and group assignments analysis and design, class participation.

Punctual attendance is mandatory, as well as the completion of intermediate and final works, activities and deliveries. Attendance of 80% is the minimum requirement to pass the first exam period.

To pass the course in the first exam period, you must obtain a final course grade of at leas 5 fo 10 in the final grade (weighted average, minimum partial grade 4).

In any case, you will need to obtain a grade of at 4.0 any of the activities. The weighted average is as follow:

- Theory: thee mid-term and final exams (40%).
- Case study: constructive projects made of case analysis and design proposals (25%, 25%) Mandatory intermediate deliveries weekly or every two weeks.
- Portfolio: the set of exercises and intermediate deliveries carried out in the classroom or as homework will be collected in a single document and will be gathered at the end of the course in a notebook. The document must include index and conclusions. (10%)

The professor will post any changes in the course forum.

7.2. Second exam period

To pass the course in the second exam period, you must obtain a final grade of at least 5 out of 10 (weighted average).

There are two situations in the second exam period.

- To pass the course in the second exam period, you must deliver the activities already grades by the professor and obtain an average grade in all activities in the table higher than or equal to 5.0 (each part minimum grade 4). This situation is available if you have only one exam o one project pending.
- For students who obtained an average qualification in the first period bellow 4. To pass the course in the second exam period, you must obtain a grade higher than or equal to 5.0 in an exam consisting in exercises and case study problems

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
Activity 1: Exam 1	week 6
Activity 2: Case study 1 / Process	week 1-9
Activity 3: Exam 2	Week 11
Activity 4: Case Study 2 / Project	week 10-16
Activity 5: Exam 3	week 14
Actividad 6. Porfolio	week 17

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAFÍA

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Documentos Código Técnico de la Edificación:
http://www.codigotecnico.org/web/recursos/documentos/

Revista Detail

Revista Tectónica

Revista AITIM- Boletines de Información Técnica

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.

3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:
orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.