Teaching guide

IDENTIFICATION DETAILS

Degree:	Architecture
Scope	Architecture, construction, building and urban planning, and civil engineering
Faculty/School:	Higher Polytechnic School
Course:	CONSTRUCTION IV
Type:	Compulsory
ECTS credits:	6
Year:	4
Code:	3746
Teaching period:	Eighth semester
Subject:	Construction
Module:	Technician
Teaching type:	Classroom-based
Language:	Spanish
Total number of student study hours:	150

SUBJECT DESCRIPTION

CONSTRUCTION IV is the last construction subject dedicated to the constructive development of new plan architectural proposals and to the student's own projects before the End of Degree Project, so this subject is crucial to finish fixing and gathering the different and specific knowledge acquired in previous courses and those developed here to be able to carry out their final construction project with sufficient rigor. As part of the general planning of this subject, in this subject the student must especially deepen their theoretical knowledge of industrialized architecture through metallic steel and aluminum systems, glass façade systems and, finally, in interior partitions and finishes. The student must put into practice all the knowledge acquired about materials, construction systems, structures, envelopes, etc., and in a comprehensive way be able to use this knowledge to develop specific construction projects. Through learning and constructively developing projects, you must learn to make every decision reflectively in the design construction process, to understand the constructive element as part

of the process and to learn to solve technical problems effectively, appropriately and economically. You must know the existing materials, systems and technological availability together with current regulations, in order to acquire a practice and method that will allow you to face construction problems in your professional future and enable you to build in the future with a mind capable of analyzing, proposing and acting according to the demands of our time.

The student must become aware of the relevance that the decisions they make have in the community in which they live and begin to cultivate a professional ethic focused on serving society, whose starting point is first of all the conditions of proper construction in the aspects of thermal insulation, waterproofness, durability, firmness, as well as adequate conditions from the point of view of the climate in which they are located. Once these fundamental aspects have been completed, the student will learn the importance that constructive decisions have in the way people live in accordance with the degree of maturity acquired in this fourth course of the subject of Construction and to think like an architect with responsibility to the Community.

GOAL

That the student is able to carry out the constructive development of a project with industrialized, modular and architectural systems with lightweight structure and materials, from the initial general conception to the level of detail, acquiring an ability to study, design and solve the construction elements according to the necessary technical, regulatory and habitability requirements.
- That he learns to make every decision reflectively in the construction process, to understand the constructive element as part of an integral process and to solve technical problems in an effective, adequate and economic way.
- That you know the existing materials, systems and technological availability, together with current regulations, in order to acquire a practice and method that allow you to face construction processes and enable you to build in the future with a mind capable of analyzing, proposing and acting according to the demands of our time.
- That he knows the constructive regulations and acquires the capacity to apply them and that he acquires the ethical commitment to be even ahead of it in terms of the technical benefits that we must offer to society.
- That it cultivates the correct graphic representation of the systems and details, since it is the means of understanding the required constructive definition and a deeper dive into the actual construction process itself, as this is the first test of their correct functioning.

PRIOR KNOWLEDGE

To follow the subject, the student must have acquired the fundamental knowledge taught in CONSTRUCTION I, II and III. It will be highly advisable to have adequate knowledge of graphic expression, to allow him to develop the work of the subject, and an important project base acquired in the project subjects of the first four years, which allows him to understand the technical and design nature of the construction and the construction process, as well as sufficient notions of designing structures and installations.

COURSE SYLLABUS

THEORETICAL SYLLABUS

Industrialized Architecture and Architecture with lightweight construction systems.

Introduction. Construction of industrialized architecture and lightweight construction systems in its historical and contemporary approach.

Theme 1. Glass façade technology: mechanical and energy behavior; systems and techniques.

1.1 Features and types of glass for the glazed facade

1.2. Evolution of the glazed façade.

1.3. Curtain wall glazing systems and their consequences from a mechanical, thermal, acoustic and energy point of view and compliance with building regulations.

1.4. Translucent glass and its systems

1.5. Polymer enclosure technology compared to glass: mechanical and energy behavior; systems and techniques.

Theme 2. Metal Technology

2.1. Metal structures: Systems, typologies and examples. Steel and aluminum.

2.2. Construction solutions for metal enclosures. Panel and joint systems, types of materials, systems, components and regulatory compliance.

2.3. Metal carpentry and detailed work elements on metal elements

Theme 3. Partitions and interior finishes: dry systems

Types of interior partitioning and interior finishes of walls, floors and ceilings. Materials, construction procedures, services and regulations.

CONSTRUCTIVE DEVELOPMENT AGENDA OF A PRACTICAL NATURE

1. The student's construction project based on their own project developed with industrialized systems. The student must undertake in phases the constructive development of their project, from the material, constructive and structural concept to the definition of execution and detail plans. The appropriateness of the construction solutions to the idea of the project and the technical quality of their resolution will be measured.

2. The student's construction project on an envelope of an unbuilt building project, or on an existing building for which general data are known but there is no substantial constructive information, with the development of lightweight construction systems. The student must undertake in phases the constructive development of the project from the material, constructive and structural concept to the definition of execution and detail plans. The appropriateness of the construction solutions to the idea of the project and the technical quality of their resolution will be measured.

- Exercise 1. Constructive development of the student on a project of a small-scale building made mostly with glass elements.
- Exercise 2. The student's construction project on a modular building, either on their own project (*) or on an alternative proposal. The student's construction project on a project developed with modular dry systems. The student must undertake in phases the constructive development of their project, from the material, constructive and structural concept to the definition of execution and detail plans. The appropriateness of the construction solutions to the idea of the project and the technical quality of their resolution will be measured.
- Exercise 3. Construction project for industrialized housing, either based on an unbuilt building or an existing one for which general data are known but there is no substantial constructive information. The student's construction project on a project developed with industrialized systems. The student must undertake in phases the constructive development of their project, from the material, constructive and structural concept to the definition of execution and detail plans. The appropriateness of the construction solutions to the idea of the project and the technical quality of their resolution will be measured.

(*) This exercise 2 is preferably carried out in cooperation with the course of Ephemeral Architecture in the same semester.

EXPOSITORY SYLLABUS (STUDENT'S EXPOSITORY WORK)

Study of the documents of the Technical Building Code (CTE) and other relevant regulations.
Study of construction materials.

EDUCATION ACTIVITIES

1. FACE-TO-FACE ACTIVITIES
1.1. Expository classes: Presentation of content and activities by the teacher, commentary, recommended reading, and with the participation of students in the debate and resolution of doubts about the topics proposed in class
1.2. Carrying out exercises: Solve, individually, on the blackboard or on the table exercises proposed in class to apply the fundamental knowledge received.
1.3. Project workshop: Correction in groups of different sizes of the projects that students carry out in the classroom or at home, and they clarify in the light of the exercises of their classmates and the instructions of their teachers.
1.4. Group work: I work in small groups to deepen the fundamental teaching principles and stimulate coordination capacity among students.
1.5. Mentoring:
- 1.5.1. Classroom tutoring: Attention to the class group to enhance the practical follow-up of the subject.
- 1.5.2. Group tutoring: Attention to a small group of students who need additional help to follow the subject
- 1.5.3. Personalized: Individual attention to the student with the objective of reviewing and discussing the topics presented in class and clarifying doubts that the student cannot understand in their personal study.
1.6. Evaluation: Carrying out knowledge assimilation checks throughout the course and with the greatest possible continuity.

2. NON-FACE-TO-FACE ACTIVITIES
2.1. Preparing projects for class discussion: Design and prepare a public presentation of a proposed exercise in class.

2.2. Group work: Group design and development of works.
2.3. Theoretical and practical study: Study of the theoretical and practical contents of the program and preparation of recommended readings.
2.4. Construction visits, technical talks and visits to companies in the construction sector.

DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
60 Horas	90 Horas

SKILLS

Basic Skills

Students must have demonstrated knowledge and understanding in an area of study that is founded on general secondary education. Moreover, the area of study is typically at a level that includes certain aspects implying knowledge at the forefront of its field of study, albeit supported by advanced textbooks

Students must be able to apply their knowledge to their work or vocation in a professional manner and possess skills that can typically be demonstrated by coming up with and sustaining arguments and solving problems within their field of study.

Students must have the ability to gather and interpret relevant data (usually within their field of study) in order to make judgments that include reflections on pertinent social, scientific or ethical issues

Students must be able to convey information, ideas, problems and solutions to both an expert and non-expert audience

Students must have developed the learning skills needed to undertake further study with a high degree of independence

Ability to solve problems and to take decisions.

Ability to apply procedures.

Knowledge of research methods and those pertaining to the preparation of construction projects.

An understanding of the problems involved in structural design, construction and engineering associated with building projects.

General Skills

Ability to solve problems and to take decisions.

Ability to apply procedures.

Knowledge of research methods and those pertaining to the preparation of construction projects.

An understanding of the problems involved in structural design, construction and engineering associated with building projects.

Specific skills

Ability to apply technical and construction standards.

Ability to preserve building structures, foundations and civil works.

Ability to evaluate works.

Adequate knowledge of the physical and chemical characteristics, production procedures, pathology and use of construction materials.

Adequate knowledge of industrialized construction systems.

Knowledge of deontology, collegial organization, professional structure and civil responsibility.

Knowledge of administrative and management procedures and professional processing.

Knowledge of measurement, assessment and assessment methods.

Knowledge of real estate management and management.

LEARNING RESULTS

Conceive, design, develop and draw complete construction projects with industrialized systems that solve the entire development of a project according to the technical conditions required from the initial general concept to the level of detail.

Design and develop complete construction sections that meet the conditions required in the envelope, the encounter with the terrain and outdoor spaces, the upper roof of the building, the interior construction elements, the integration of the construction of the structure and the resolution of the encounters between the construction elements in lightweight architectural systems.

Solve construction developments with advanced glass systems, specializing in a specific construction solution, and from a general point of view, so that they meet the required conditions in the envelope, from the conceptual

level to the level of detail.

Solve construction developments with the various façade systems made of lightweight, metallic or non-metallic panels, specializing in a specific construction solution, and from a general point of view, so that they meet the required conditions in the envelope, from the conceptual level to the level of detail.

Resolve construction developments with modular or industrialized lightweight structure systems, specializing in a specific construction solution, and from a general point of view, so that they meet the conditions required for the complete development of the construction project, from the conceptual level to the level of detail.

Develop constructive solutions that show coherence, rationality and economy of means, and where the importance of constructive materialization and rationalization in the development of light and industrialized architecture projects is understood.

Make and develop construction plans that consider the integration of construction and materiality with the characteristics of a project, the adaptation to climatic and environmental requirements and the compatibility between construction and structural systems and their general functioning.

Know the regulations in force and develop an ability to implement technical standards and logical construction principles that enable adequate execution and durability of buildings.

Choose the appropriate plans for the description of the construction systems of the lightweight architecture project, the scale appropriate to their description, the clarity in the graphic representation of the drawings (sections, details, etc.) for their correct understanding, the necessary degree of development in the description of the construction solutions of the project and the necessary definition of legends, labels and dimensions.

Acquire criteria for evaluating and evaluating the economic component in construction solutions that allows us to begin to become aware of the impact of the valuation of works and solutions that allow economic control of construction elements.

Acquire awareness of the architect's responsibility, both in the project and on site, of the management and processing systems and of the organization of those involved in the process. Acquire a basis for being aware of what concrete solutions represent in the real estate management of a construction project in terms of their scope, performance and valuation.

LEARNING APPRAISAL SYSTEM

CONTINUOUS EVALUATION
This course is based on continuous evaluation. The student will demonstrate with his work his partial deliveries, his corrected autonomous exercises, his work in the classroom and general attitude towards his learning if he is qualified in the competencies that he is expected to develop in this subject.
Periodically, an exercise will be carried out in relation to the contents of the course. To pass the subject per course, it will be mandatory to submit all the exercises on time. The exercises will be graded from 0 to 10 and general corrections will be made on a regular basis. In addition, the following should be taken into account:
A.1. CRITERIA FOR APPROVING:
The student will pass per course if:
- Attend at least 80% of classes if the student intends to be evaluated on a continuous basis, otherwise he will be

eligible for the extraordinary call. In the case of repeat students with obvious time incompatibility, a waiver will be made on this percentage of attendance and an appropriate solution will be sought according to the subjects affected.

A.1.1 DELIVERY OF EXERCISES: 80% of the final grade

- Deliver the course exercises on the date and time indicated. An exercise is considered delivered when it meets all the basic content and format requirements indicated in the statement. Insufficient work can be compensated by other approved ones since the average established in the evaluation prevails.
- You must obtain a weighted average grade for the years between 5 and 10 to be eligible for the one approved by continuous evaluation, given their fundamental nature, regardless of the following grade percentages (A.1.2, A.1.3 and A.1.4), which will only be effective after a minimum average score of 5.
- Exercises delivered after the deadline will be graded with a maximum score of five (5). Only one overdue exercise will be admitted to the continuous evaluation. The distribution of grades will be as follows (percentages over 100% of the part corresponding to the course exercises):

Exercise 1. Student construction project on a building project whose predominant material is glass: 33.33%

Exercise 2. The student's construction project on a modular building, either on their own project (*) or on an alternative proposal: 33.33%

Exercise 3. Construction project for dry-built industrialized housing, either on the basis of an unbuilt building or an existing one for which general data are known but there is no substantial constructive information: 33.33%

(*) This exercise 2 is preferably developed in cooperation with the subject of Ephemeral Architecture.

A.1.2 CONSTRUCTIVE TOPIC PRESENTATION WORK: 5% of the final grade.

The student researches, studies, prepares and develops a proposed constructive work and makes a public presentation in class. It can be carried out individually or integrated as part of a working group. In addition to the exhibition, the work is also delivered in digital format. Evaluation is measured as follows:

- Correct study and documentation in the preparation of the topic: 30%
- Adequate development and argument of the topic: 50%
- Expository clarity of the topic: 20%

A.1.3 COURSE FOLLOW-UP: 10% of the final grade.

This follow-up and attitude towards the subject will be measured as follows:

- Participation and active attention in exhibition classes: 10%
- Participation in short class exercises and drawings on the blackboard: 60%
- Positive student evolution throughout the course: 15%
- Timely delivery of coursework in time, form and content: 15%

A.1.4. UNIVERSITY EXTENSION ACTIVITIES: 5% of the final grade

- Collaboration, assistance and participation in university extension activities pertaining to the subject.

Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations.

A.2. QUALIFICATION CRITERIA AND JOB IMPROVEMENTS

The qualification of the coursework will be subject to evaluation criteria that the student will know in advance in the statements through rubrics. The corrections of the papers before delivery will respond to the steps that the student must take, which may vary depending on where their work is located. These corrections can be made on paper or through appropriate virtual classroom resources. Any improvement can be made by teaching, correcting and attending other corrections during the course of the practice through classes and tutoring. Any note made in class about one student's work will affect the rest; therefore, it will not be necessary to repeat to each student what should be improved if these improvements are repeatedly exposed in the context of public correction. If a student wishes to recover an exercise not submitted on the corresponding date, it will be evaluated as delivered after the deadline and they will have the penalty indicated in section A.1.1, that is, it will be assessed as delivered out of date and will score five (5) at most. No more coursework can be improved or submitted after the due date during the continuous evaluation.

Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations.

EVALUATION IN ORDINARY AND EXTRAORDINARY CALLS
B.1. EVALUATION IN AN ORDINARY CALL
Following the indications of the Report for the Request for Verification of the Degree in Architecture, students who do not pass the course by continuous evaluation may be eligible for the ordinary call. Those students who do not reach the average grade of five (5) will have to submit all the insufficient or pending papers, which will be evaluated on the same criteria set out in the statements, and whose grade will amount to 100%. In the ordinary evaluation, sections A.1.2, A.1.3 and A.1.4 of the continuous evaluation will not be considered.
Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations.
B.2. EVALUATION IN EXTRAORDINARY CALL Following the indications of the Report for the Request for Verification of the Degree in Architecture, students who do not pass the course in previous calls may be eligible for the extraordinary call. Those students who do not reach the average grade of five (5) will have to submit all the insufficient or pending papers and take a final exam of the course. To carry out this exam, it will be necessary to submit all the works of the course, which will be evaluated on the criteria set out in the statements, and whose grade will represent 55% of the grade of the extraordinary call. The remaining 45% of the grade will result from a face-to-face knowledge exam in which you will be asked about the most relevant procedures of the course, usually drawn.
Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations.

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:
a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.
b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.
c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(https://www.ufv.es/gestion-de-la-informacion_biblioteca/).
d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.
2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the Guide for the Responsible Use of Artificial Intelligence in Studies at UFV. Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.
3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

Desplezes, Andrea Building Architecture: From Raw Material to Building, a Material Editorial Gustavo Gili, 2010

Araujo, Ramón Architecture as Technique. 1, Surfaces ATC EDICIONES, 2007

Araujo, Ramón Architecture as Technique. 2, Building at Height Editorial Reverte, 2012
(Araujo, Ramón Architecture as Technique. 2, Building at Height Editorial Reverte, 2012 , ||Araujo, Ramón Construction: Techniques and Systems: Architecture as Technique 3 E.T.S. Architecture (UPM). 2020)

Additional

Miscellaneous. Asefave Manual for Lightweight Facades AENOR 2006

Various. Ministry of Housing and Urban Agenda Technical Building Code (CTE) Since 2006
(Various. Ministry of Housing and Urban Agenda Technical Building Code (CTE) Since 2006 , https://www.codigotecnico.org/)