Teaching guide

IDENTIFICATION DETAILS

Degree:	Architecture
Scope	Architecture, construction, building and urban planning, and civil engineering
Faculty/School:	Higher Polytechnic School
Course:	ARCHITECTURE AND SUSTAINABILITY
Type:	Compulsory
ECTS credits:	6
Year:	3
Code:	3736
Teaching period:	Sixth semester
Subject:	Projects
Module:	Projectual
Teaching type:	Classroom-based
Language:	Spanish
Total number of student study hours:	150

SUBJECT DESCRIPTION

The principles, objectives, benefits, costs and strategies of sustainable architecture will be defined in depth, in order to transform the way in which buildings are designed, built and used, so as to generate a healthy and prosperous environment that increases the quality of life.
“Architects cannot solve all the world's ecological problems, but if sustainability is more than a fad, we must ask ourselves some basic questions” (Norman Foster).

GOAL

Know the criteria related to sustainability in architecture and be able to incorporate them into a project, evaluating the efficiency of the different strategies (definition of objectives, schematic analysis, supporting calculations, etc.). At the end of the course, the student should be able to propose architectural strategies that increase the sustainability of their projects, being able to evaluate their performance according to the main environmental certification systems currently in use.

PRIOR KNOWLEDGE

It is advisable to have passed the subjects of previous courses, especially those relating to the subjects of PHYSICS, GRAPHIC EXPRESSION, CONSTRUCTION, INSTALLATIONS AND PROJECTS.

COURSE SYLLABUS

1. CONTEXT
Sustainability is an attribute of good architecture, which seeks to improve people's quality of life, while reducing the negative impacts that the construction and use of buildings can produce on the environment, the economy and society
1.1. Building sector
1.2. Agreements
1.3. Actuality
2. CHARACTERIZATION
“Architecture, to be good, implies being sustainable. You can't applaud a building because it's sustainable. It would be like applauding him because he endures” (Souto de Moura)
2.1. Evolución
2.2. Fashion?
2.3. Benefits
2.4. Barreras
3. CERTIFICATION
The behavior of a building is a set of facts and not just promises, so the use of recognized evaluation and certification methodologies is mandatory to counteract the usual practice of classifying buildings as sustainable, using confusing and unverifiable information.
3.1. Energetic
3.2. Ambiental
3.3. Wellness
3.4. Corporate
4. EMPLACEMENT
“Private buildings will have a correct location if from the beginning the orientation and climate where they are going to be erected have been taken into account” (Vitruvius). The location of a project, that is, its context and its relationship with surrounding areas, is as important as the way in which it is built.
4.1. Situation
4.2. Deployment
5. ENERGY
The buildings shall have a thermal envelope with characteristics such as to limit the primary energy requirements to achieve thermal well-being depending on the climate zone of their location, the summer and winter regime and the use of the building. The thermal installations available in the buildings will be appropriate to achieve the thermal well-being of their occupants. The energy consumption of buildings will be limited depending on the

climate zone of their location and the use of the building and will be satisfied, to a large extent, through the use of energy from renewable sources.
5.1. Passive strategies (bioclimatic architecture)
5.2. Active strategies (energy efficiency)
5.3. Renewable strategies (self-consumption)
6. WELL-BEING
People spend 90% of their time inside buildings, so it is essential that they guarantee minimum conditions of well-being: hygrothermal, lighting, acoustics and air quality.
6.1. Hygrothermic
6.2. Air quality
6.3. Lighting
7. WATER
Buildings that use significantly less water than conventional buildings can be built by incorporating native species into the landscape that does not require additional irrigation measures, installing efficient sanitary appliances and allocating drinking water to those uses that truly require it.
7.1. Consumption
7.2. Recovery
8. MATERIALS
The selection of materials must be considered both from the impacts that are due to manufacturing, processing, transport, construction, maintenance, demolition and recycling or the disposal of the materials themselves, but also from their influence on the environmental performance of the building as a whole.
8.1. Characterization
8.2. Eco-labels
8.3. Life Cycle Analysis

EDUCATION ACTIVITIES

1. In-person activities.
1.1. Expository classes: Presentation of content and activities by the teacher 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 the teacher.
1.4. Evaluation: Carrying out knowledge assimilation checks throughout the course and with the greatest possible continuity.
1.5. Mentoring:
1.5.1. 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.
1.5.2. Group: Attention to a small group of students who need additional help to follow the subject.
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 carrying out the recommended activities.

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

An adequate knowledge of the history and theories of architecture, as well as the arts, technology and human sciences related to them.

Ability to appreciate the architect's profession and its function in society, particularly with regard to the design of projects that involve social factors.

An adequate knowledge of the physical and various technological problems that may exist, and those pertaining to the function of buildings, with a view to providing them with internal conditions of comfort and of protection from adverse climatic factors.

General Skills

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Ability to appreciate the architect's profession and its function in society, particularly with regard to the design of projects that involve social factors.

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Specific skills

Adequate knowledge of methods for studying social needs, quality of life, habitability and basic housing programs.

Adequate knowledge of ecology, sustainability and the principles of conservation of energy and environmental resources.

Adequate knowledge of the architectural, urban and landscape traditions of Western culture, as well as their technical, climatic, economic, social and ideological foundations.

LEARNING RESULTS

Know the categories and evaluation requirements of the most widespread sustainability certification systems, such as LEED, BREEAM or Verde||Recognize the principles and good practices of sustainable architecture and construction

Describe the sustainable strategies implemented in built buildings

Calculate the performance of sustainable strategies that can be incorporated into a project||Synthesize architectural strategies that can influence the improvement of the environmental, economic and social performance of a proposal||Propose the architectural strategies necessary to guarantee habitability and reduce negative environmental impacts derived from the building process

Estimate the level of certification that a project could obtain based on the performance of the strategies incorporated in the project

LEARNING APPRAISAL SYSTEM

A. CONTINUOUS EVALUATION
This course is based on continuous evaluation, in a theoretical and practical way:
- Theory 50%: Exam (test and development questions), at the end of the course, of all the contents of the syllabus.
- Practices 50%: Analysis of certified buildings, explaining through schemes and diagrams the sustainable strategies they include (15%). Application of the theoretical contents of the subject to a project under development during the same course in other subjects (35%).

A.1. CRITERIA FOR APPROVING Attend at least 80% of classes. Take the exam and submit all the practices (in a timely manner). Obtain an average score between theory and practice of 5 to 10, not being able to have a score lower than 4 in each separate part. In case of incompatibility of schedules for justified reason (duly notified in advance), the student may be exempted from the minimum attendance requirement.
B. EVALUATION IN ORDINARY AND EXTRAORDINARY CALLS
B.1. EVALUATION IN ORDINARY CALL (according to academic calendar) Following the indications of the Report for the Request for Verification of the Degree in Architecture, students who do not pass the course or do not take it may be eligible for an exam in the ordinary call. Before the day of the exam, according to the published date, it will be necessary to submit ALL the practices of the course, which will be evaluated on the same criteria set out in the statements, and whose score will amount to 20%. The remaining 80% of the grade will result from a face-to-face exam that will include questions in various formats (test, exercises and development).
B.2. EVALUATION IN EXTRAORDINARY CALL (according to academic calendar) Following the indications of the Report for the Request for Verification of the Degree in Architecture, students who do not pass the course or do not complete it may be eligible for an exam in the ordinary call. Before the day of the exam, according to the published date, it will be necessary to submit ALL the practices of the course, which will be evaluated on the same criteria set out in the statements, and whose score will amount to 20%. The remaining 80% of the grade will result from a face-to-face exam that will include questions in various formats (test, exercises and development).
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. Among the reasons that may decide to suspend or cancel practices and/or exams are: copied, plagiarized or traced content; carrying or having around any digital device even if it is turned off.

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

F. Javier Neila Gonzalez. Bioclimatic architecture in a sustainable environment/Madrid: Munilla-Lería, 2004.
(F. Javier Neila Gonzalez. Bioclimatic architecture in a sustainable environment/Madrid: Munilla-Lería, 2004. , ||Francis D. K. Ching, Ian M. Shapiro. Ecological architecture an illustrated manual/Barcelona:Editorial Gustavo Gili, 2015.)

Future Habitat Group. Habitat Futura: The magazine for architecture and sustainable building/Barcelona:Grupo Habitat Futura.

Additional

directed by Guillermo Raúl Kliczkowski. Casas Houses:Ecological Houses = Ecological Houses/Buenos Aires:Design, 2017.
(directed by Guillermo Raúl Kliczkowski. Casas Houses:Ecological Houses = Ecological Houses/Buenos Aires:Design, 2017. , ||Dominique Gauzin-Müller; with the collaboration of Nicolas Favet and Pascale Maes. Ecological architecture/Barcelona: Gustavo Gili, 2006.)

Ken Yeang. Designing with nature: ecological bases for the architectural project/Barcelona:Gustavo Gili, 2007.
(Ken Yeang. Designing with nature: ecological bases for the architectural project/Barcelona:Gustavo Gili, 2007. , ||César Reyes, Ethel Baraona Pohl, Claudio Pirillo. Sustainable Architecture/Alboraya (Valencia): Editorial Pencil, 2007.)