1. BASIC INFORMATION

Course	Sustainability in the building environment
Degree program	Bachelor's in the Fundamentals of Architecture
School	Architecture, Engineering and Design
Year	Fifth
ECTS	6 ECTS
Credit type	Compulsory
Language(s)	English
Delivery mode	Face to face
Semester	Second
Academic year	2024-25
Coordinating professor	Susana Moreno Soriano

2. PRESENTATION

The objective of this subject is to develop skills to integrate urban and building scales, and their technical and architectural design, according to sustainability principles. The contents include topics related to society, economics, energy management, materials, water and urban solid waste in the local context.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- CB1 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 vanguard of their field of study.
- CB2 Students can apply their knowledge to their work or vocation in a professional way and have competences that can be displayed by means of elaborating and sustaining arguments and solving problems in their field of study.
- CB3 Students have the 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 Students can communicate information, ideas, problems and solutions to both the specialist and non-specialist.
- CB5 Students have developed the necessary learning skills to undertake further studies with a high level of autonomy.

Cross-curricular competencies:

- CT01 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.
- CT02 Self-confidence.
- CT03 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.

- CT04 Communication skills in the native language (both oral and written) and in the English language, in accordance with the principles 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.
- CT05 Interpersonal skills.
- CT06 Flexibility.
- CT07 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 come together. This ability includes skills for interpersonal relations and team leadership.
- CT08 Initiative and the spirit of an entrepreneur, both in the area of architecture as well as in business.
- CT09 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 the both the aesthetic and technical demands. This competence includes critical reasoning and historical culture.

Specific competencies:

- CE20 Ability to conceive, calculate, design, integrate in buildings and urban units and execute supply systems, water treatment and sewage, heating and air conditioning.
- CE22 Ability to project building and urban transformers and power supply systems, audiovisual communication, acoustics and artificial lighting.
- CE23 Ability to preserve installations.
- CE35 Ability to solve passive environmental conditioning, including thermal and acoustic insulation, climate control, energy efficiency and natural lighting.
- CE52 Adequate knowledge of ecology, sustainability and the principles of conservation of energy and environmental resources.
- CE53 Adequate knowledge of the architectural, urban and landscaping traditions of western culture, as well as their technical, climatic, economic, social and ideological foundations.

Learning outcomes:

- RA1: Acquire the skills to develop the design of a building complex that is sustainable within an urban framework
- RA2: Acquire the skills to identify and recognise sustainable construction or urban planning
- RA3: Analyse activities through graphic, written and numerical methods.
- RA4: Understand the energy performance of different constructions
- RA5: Understand the impact on the environment of the construction process, elements, materials and different types of construction.
- RA6: Acquire the skills to develop systems for the proper management of natural resources.
- RA7: Acquire the skills to be critical and creative resulting from the knowledge of climate design as an experimental process.
- RA8: Acquire the intellectual skills for abstraction thinking and the concept of universality in order to understand the complexity of sustainable design.

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

Competencies	Learning outcomes
CB1, CB2, CB3, CB4, CB5, CG4, CG5, CG6, CG7, CT3, CT4, CT7, CT10, CE20, CE22, CE35,CE47,CE52, CE53	RA1: Acquire the skills to develop the design of a building complex that is sustainable within an urban framework
CB1, CB2, CB3, CB4, CG4, CG5, CG6, CG7, CT9, CE52, CE53	RA2: Acquire the skills to identify and recognize sustainable construction and urban planning
CB1, CB2, CB3, CB4, CG4, CG5, CG6, CG7, CT9, CE52, CE53	RA3: Analise activities through graphic, written and numerical methods
CB1, CB2, CB3, CB4, CG4, CG5, CG6, CG7, CT9, CE 22, CE23, CE35, CE52	RA4: Understand the energy performance of different construction
, CB1, CB2, CB3, CB4, CG4, CG5, CG6, CG7, CT9, CE 20, CE 22, CE35, CE52	RA5: Understand the impact on the environment of the construction process, elements, materials and different types of construction
CB1, CB2, CB3, CB4, CG4, CG5, CG6, CG7, CT9, CE52, CE53	RA6: Acquire the skills to develop systems for the proper management of natural resources
CB1, CB2, CB3, CB4, CG4, CG5, CG6, CG7, CT9, CE20, CE35, C52, C53	RA7: Acquire the skills to be critical and creative resulting from the knowledge of climate design as an experimental process
CB1, CB2, CB3, CB4, CG4, CG5, CG6, CG7, CT9, CE52, CE 53	RA8: Acquire the intellectual skills for abstraction thinking and the concept of universality in order to understand the complexity of sustainable design

4. CONTENT

UA1 Knowledge of the urban and territorial context, as well as its resources.
Topic 1 Society, economy, urban planning and sustainable architecture.
Topic 2 Natural spaces and biodiversity. Climate, topography, water resources, etc.
Topic 3 In-depth knowledge and in all its dimensions of architectures linked to a settlement:
Bioclimatic strategies in urban design. Eco-neighbourhoods. Building complexes in urban contexts considering sustainability.

UA2. Passive design in buildings applications.
Topic 4. Environmental quality in construction.
Topic 5 Climatic design in architecture.
Topic 6. Energy efficiency. Form, geometry, envelope and insulation.

UA3.: Life cycle and circularity of resources.
Topic 7. The resources of the eco-sphere and the techno-sphere.
Topic 8: Building construction. Sustainable materials, products, elements and systems
Topic 10. Circularity in construction: Designing for deconstruction and recycling of materials.

5. TEACHING-LEARNING METHODOLOGIES

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

- The following are the types of teaching-learning methodologies that will be applied:
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- Master classes.
- Case studies.
- Teamwork.
- Problem-based learning.
- 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:

Campus-based mode:

Learning activity	Number of hours
Master classes	12,5 h
Guided studies, practical	50 h
Exercises, problme solving	12.5 h
Presentations of projects	25 h
Inclusive approach to working groups	25 h
Independent work	25 h
Tutorial follow up and evaluations	25 h
TOTAL	**150 h**

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
Understands the conditioning factors of the territory and resources in the conformation of settlements (climate, topography, water resources, vegetation and biodiversity, urban morphology, infrastructures, socio-cultural, demographic and economic conditioning factors of the population).	35%

It understands the formal and functional constructive logics, etc., of architectures linked to these resources.	
Understands the conditioning factors of the environment, both as resources of natural and social origin, in the conformation of different architectures and settlements. Is able to draw conclusions by comparison between different cases that have practical application in architectural or urban interventions.	20%
Understands the variables that define an eco-neighbourhood or sustainable settlement. Relates this evaluation to the possibilities of intervention with sustainable urban design tools and architectural projects. Knows how to develop technological systems with sustainability and circularity criteria. Knows how to design solutions capable of responding passively to the environment. Knows how to integrate active technologies for the use of energy and environmental resources.	45%

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 in each the three Units. The final grade will be weighted average of the three.

In any case, you will need to obtain a grade greater than or equal to 4.0 in each single activity.

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. The final grade will be weighted average of the three.

In any case, you will need to obtain a grade of at 4.0 in the final exam in order for it to count towards the final grade along with all the grades corresponding to the other activities.

The student must deliver the activities not successfully completed in the first exam period after having received the corresponding corrections from the professor, or those that were not delivered in the first place.

8. SCHEDULE

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

Assessable activities	Deadline
Activity 1	Week 1-13
Activity 2	Week 1-14
Activity 3	Week 2-15

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. BIBLIOGRAPHY

The main reference work for this subject is:

GEHL, Jan (ed. 2010) Cities for People Island Press. Washington
EDWARDS, Brian (ed. 2005) Guía Básica de la Sostenibilidad G. Gili, Barcelona
OLGYAY; Víctor (ed. 2015) Arquitectura y Clima. Manual de Diseño Bioclimático para Arquitectos y Urbanistas. G. Gili, Barcelona

The following is the recommended bibliography:

BROWNELL, Blaine Erickson (ed. 2006) Transmaterial: a catalog of materials that redefine our physical environment I, II y III, Princeton Architectural Press
BRAUNGHART, Michael; MCDONOUGH, William (ed. 2005) Cradle to Cradle: Remaking the Way We Make Things De la cuna a la cuna. Rediseñando la forma en que hacemos las cosas William McGraw-Hill, Madrid
BRAUNGHART, Michael; MCDONOUGH, William (2013) The Upcycle: Beyond sustainability - Designing for Abundance. Editorial North Point Princeton, USA.
BENYUS, Janine M. (ed. 2002) Biomimicry: Innovation Inspired by Nature Perennial, London 2002
HERZOG, T. (ed. 1996). Solar Energy in Architecture and Planning. Prestel, Berlin.
DANIELS, Klaus.(ed. 1994) The Technology of Ecological Building. Basis, Principles and Measures, Examples and Ideas. Birkhäuser, Basel

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.
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