



Universitat de Lleida

DEGREE CURRICULUM
SUSTAINABLE CONSTRUCTION
I

Coordination: CABEZA FABRA, LUISA FERNANDA

Academic year 2023-24

Subject's general information

Subject name	SUSTAINABLE CONSTRUCTION I			
Code	101431			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Architectural Technology and Building Construction	4	OPTIONAL	Attendance-based
	Bachelor's Degree in Energy and Sustainability Engineering	4	OPTIONAL	Attendance-based
	Bachelor's Degree in Mechanical Engineering	4	OPTIONAL	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRAULA	TEORIA	
	Number of credits	3	3	
	Number of groups	1	1	
Coordination	CABEZA FABRA, LUISA FERNANDA			
Department	INDUSTRIAL AND BUILDING ENGINEERING			
Teaching load distribution between lectures and independent student work	60 attended hours in class 90 hours of autonomous work			
Important information on data processing	Consult this link for more information.			
Language	English			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BORRI , EMILIANO	emiliano.borri@udl.cat	6	To be agreed with the teacher
CABEZA FABRA, LUISA FERNANDA	luisaf.cabeza@udl.cat	1,2	To be agreed with the teacher

Subject's extra information

Subject that requires continuous work throughout the semester in order to achieve the established goals. It is recommended to frequently visit the Virtual Campus of this subject because it announces all the information in it.

Learning objectives

- Search for information in foreign language.
- Writing a report about Sustainable Construction that reflects all aspects of it.
- Take into account all regulatory and environmental implications of materials and construction solutions used.
- Properly presentation by means project planes.

Competences

UdL2. Command of a foreign language. / CT2. Master a foreign language, especially English.

CB2. That students know how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.

CG6. Have adequate knowledge of the concept of the company, the institutional and legal framework of the company and the organization and management of companies.

CG15. Have basic knowledge of production and manufacturing systems.

CG16. To have basic knowledge and application of environmental technologies and sustainability.

CG17. Have applied knowledge of business organization.

CT1. Acquiring adequate comprehension and oral and written Catalan and Spanish.

CT3. Acquire training in the use of new technologies and information and communication technologies.

CT4. To acquire basic knowledge of entrepreneurship and professional environments.

EPS2. Capacity to gather and interpret relevant data, within the area of study, to judge and think about relevant subjects of social, scientific and ethical nature. / CB3. That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant issues of a

social, scientific or ethical nature.

EPS3. Capacity to convey information, ideas, problems and solutions to both a specialized and no specialized public. / CB4. That students can transmit information, ideas, problems and solutions to a specialized and non-specialized public.

EPS4. To have the skills required to undertake new studies or improve the training with self-direction. / CB5. That the students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

EPS7. Capacity to work in situations with a lack of information and/or under pressure.

EPS8. Capacity of planning and organizing the personal work.

EPS9. Capacity for unidisciplinary and multidisciplinary teamwork.

EPS13. Capacity to consider the socioeconomic context as well as the sustainability criteria in engineering solutions.

GEE12. Manufactured or traditional constructive systems and materials knowledge, its varieties and physics and mechanical characteristics that define them.

GEE13. Capacity to adapt the materials of construction to the typology and use of buildings; manage the reception and the quality control of the materials, its use in the building works, the execution control of the units of work and the performance of tests and final proofs.

GEE20. Knowledge of the environmental impact evaluation for building and demolition process, of sustainability in buildings, and of the procedures and techniques to determine the energy efficiency in buildings.

GEE21. Capacity to apply technical rules to the building process, and produce documents of technical specification of the procedures and constructive methods of buildings.

CE4. Have knowledge and skills for the application of materials engineering.

CE12. To have applied knowledge about renewable energies.

CE13. Acquire knowledge and capacity for modeling and simulation of system.

CE15. To acquire the ability to understand, interpret and apply the legislation on energy and environment.

GEM23. Knowledge and capacity for the calculation and design of structures and industrial constructions.

GEM34. Knowledge and capacity for the analysis and reduction of energetic demand in buildings.

GEM35. Capacity to make energy audits and the corresponding certification according to the existing laws.

GEM36. Capacity to make life cycle analysis of materials and of water and energy flows in order to reduce the environmental impact of construction.

Subject contents

CONTENTS

1. Introduction

1.1. Building sector

1.2. Definition of sustainability

1.3. Definition of bioconstruction

1.4. Definition of sustainable construction

1.5. key points in the sustainable construction

2. Materials

2.1. Introduction

2.2. Materials for the sustainable construction

2.3. Materials and life cycle for buildings

2.4. Eco-labels in the building sector

2.5. Life cycle analysis

3. Energy

3.1. Introduction

3.2. Passive systems

3.3. Energy efficiency

3.4. Renewable energies

4. Water

4.1. Introduction

4.2. Water treatment systems

4.3. Water saving systems

4.4. Water purifying systems

4.5. Water recovery systems

5. Wastes

5.1. Introduction

5.2. Wastes management

5.3. General concepts about special wastes

5.4. Wastes management in construction

5.5. Deconstruction

5.6. Special wastes

6. Health

6.1. Introduction

6.2. Sick building syndrome

6.3. Materials and products harmful for health

6.4. Illness

6.5. Good practices to create a healthy environment

Methodology

The methodology of the course will follow the next lines:

1. Theoretical sessions where teachers expose theoretical contents
2. Practical sessions where students are the main core of the learning process: students will work on group or individually.

Development plan

To see the temporal planning of the subject, see the file that will be uploaded before the start of the second semester in the resources section of the Virtual Campus.

Evaluation

There will be two written exams (50%)

- 1st exam 20% - during the week of exams indicated by EPS
- 2nd exam 30% - during the week of exams indicated by EPS

Group work (50%)

- Two oral presentations: 10% - the dates of the presentations will be indicated no later than the first lecturing week
- Final oral presentation: 20% - the dates of the presentations will be indicated no later than the first lecturing week
- Final project: 20% - will be delivered at the same time as the final oral presentation

Both exams can be retaken on the day indicated by EPS.

Alternative assessment

The alternative assessment will consist of an exam that will be carried out on the recovery day indicated by the EPS and an individual work following the group work guidelines of the continuous assessment.

Bibliography

Recommended bibliography

- F. Javier Neila González, Arquitectura bioclimática: un entorno sostenible
- Bjorn Berge, The Ecology of Building Materials, 2000. ISBN: 978-0-7506-5450-0
- Diversos autores, Un vitruvio ecológico. Principios y práctica del proyecto arquitectónico sostenible, 1999. ISBN: 978-84-252-2155-2
- Albert Cuchí, Arquitectura i sostenibilitat, 2005. ISBN: 84-8301-839-X

- D. Anink, C. Boonstra, J. Mak, Handbook of sustainable building. An Environmental Preference Method for Selection of Materials for Use in Construction and Refurbishment, 1996. ISBN: 1-873936-38-9
- Calkings, Materials for Sustainable Sites, 2009. ISBN: 978-0-470-13455-9
- Ronald Rael, Earth Architecture, 2009. ISBN: 978-1-56898-767-5