



Universitat de Lleida

DEGREE CURRICULUM
SUSTAINABLE CONSTRUCTION
1

Coordination: PÉREZ LUQUE, GABRIEL

Academic year 2019-20

Subject's general information

Subject name	SUSTAINABLE CONSTRUCTION 1			
Code	101431			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Mechanical Engineering	4	OPTIONAL	Attendance-based
	Bachelor's Degree in Architectural Technology and Building Construction	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	PÉREZ LUQUE, GABRIEL			
Department	COMPUTER SCIENCE AND INDUSTRIAL 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			
Office and hour of attention	Send an email in order to arrange a date			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
CABEZA FABRA, LUISA FERNANDA	luisaf.cabeza@udl.cat	0	
CHÀFER NICOLÁS, MARTA	marta.chafer@udl.cat	3,6	
PÉREZ LUQUE, GABRIEL	gabriel.perez@udl.cat	3,6	

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

University of Lleida strategic competencies

- **UdL2 Command of a foreign language.**

Degree specific competences

- **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.**

Degree transversal competences

- **EPS3. Capacity to convey information, ideas, problems and solutions to both a specialized and no specialized public.**
- **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.**

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 grup or individually.

Development plan

Week	Day	Content	Teacher
1	12 SET	Subject presentation/workgroup presentation	Gabriel Pérez Marta Chafer
		Introduction	Gabriel Pérez
2	18 SET	Materials_A	Gabriel Pérez
	19 SET	Materials_B1	Gabriel Pérez
3	25 SET	Materials_B2	Gabriel Pérez
	26 SET	Materials_C (C2C)	Gabriel Pérez
4	2 OCT	Project review 1	Marta Chafer Gabriel Pérez
	3 OCT	Project review 1	Marta Chafer Gabriel Pérez

5	9 OCT	Waste	Gabriel Pérez
	10 OCT	Waste	Gabriel Pérez
6	16 OCT	Water	Gabriel Pérez
	17 OCT	Water	Gabriel Pérez
7	23 OCT	Health	Marta Chafer
	24 OCT	Health	Marta Chafer
8	30 OCT	Project review 2	Marta Chafer Gabriel Pérez
	31 OCT	Project review 2	Marta Chafer Gabriel Pérez
9	7 NOV (9h)	1 st exam (theory and problems) Classroom L4 EPS	Gabriel Pérez
10	13 NOV	Energy	Marta Chafer
	14 NOV	Energy	Marta Chafer
11	20 NOV	Sustainable construction week	Marta Chafer Gabriel Pérez
	21 NOV	Sustainable construction week	Marta Chafer Gabriel Pérez
12	27 NOV	Project review 3	Marta Chafer
	28 NOV	Project review 3	Marta Chafer
13	4 DES	Energy	Marta Chafer
	5 DES	Energy	Marta Chafer
14	11 DES	Energy	Marta Chafer
	12 DES	Energy	Marta Chafer
15	18 DES	Project presentation	Gabriel Pérez Marta Chafer
	19 DES	Project presentation	Gabriel Pérez Marta Chafer
		Christmas holidays	
16	14 January (15h)	2 nd exam (theory and problems) Classroom 1.04 EPS	Marta Chafer
17,18	Tutoring and doubts		Marta Chafer Gabriel Pérez
19	30 January (9h)	Recovery (theory and problems) Classroom L4 EPS	Marta Chafer Gabriel Pérez

Evaluation

There will be two single written tests (50%):

- 1st exam: 20%
- 2nd exam: 30%

Group work (50%)

- Oral presentation at half project development 10%

- Oral presentation at the end of the project: 20%
- Final project: 20%

During the 19th week it can be recover / improve the grade of the subject, following the guidelines of the Academic Degrees Framework of EPS, through a recovery test, which will have equal value and content to the theoretical contents (50%).

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 autors, 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