



Universitat de Lleida

DEGREE CURRICULUM
**RENEWABLE ENERGY
RESOURCES**

Coordination: CHEMISANA VILLEGAS, DANIEL

Academic year 2022-23

Subject's general information

Subject name	RENEWABLE ENERGY RESOURCES			
Code	102141			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Energy and Sustainability Engineering	2	COMPULSORY	Attendance-based
	Common branch in industrial engineering programs - Lleida	2	COMPULSORY	Attendance-based
	Double bachelor's degree: Degree in Mechanical Engineering and Degree in Energy and Sustainability Engineering	2	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	0.6	2.4	3
	Number of groups	2	1	1
Coordination	CHEMISANA VILLEGAS, DANIEL			
Department	ENVIRONMENT AND SOIL SCIENCES			
Teaching load distribution between lectures and independent student work	40% lectures 60% independent student work			
Important information on data processing	Consult this link for more information.			
Language	Catalan and Spanish			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
CHEMISANA VILLEGAS, DANIEL	daniel.chemisana@udl.cat	2,5	
MORENO BELLOSTES, ALEXANDRE	alex.moreno@udl.cat	2,5	
SOLANS BARON, ALEJANDRO	alejandro.solans@udl.cat	1,6	

Competences

Basic

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.

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.

CB5. That the students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

Transversals

CT2. Master a foreign language, especially English.

CT5. To acquire essential notions of scientific thinking.

Generals

CG2. Understand and master the basic concepts of the general laws of mechanics, thermodynamics, fields and waves, and electromagnetism and their application to solve engineering problems.

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

Specific

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

CE12. To have applied knowledge about renewable energies.

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

CE16. Acquire capacity to assess the impacts of energy resources through knowledge of the natural environment and conduct energy and environmental audits.

CE17. Acquire the ability to identify, evaluate and quantify available energy resources.

Subject contents

Topic 1. Energy and society

- History of the use of energy
- Global and national energy context.
- Policy and energy framework.
- Definitions of energy and its units

Topic 2. Forms of energy, performance of the basic energy transformations

- Type of energy: Electrical, thermal, mechanical, ...
- Energy transformations. Electrical and thermal engines.
- Basic principles of electric and thermal engines.

Topic 3. Non-renewable energy resources

- Fossil energy resources.
- Energy resources of nuclear origin.
- Distribution of energy resources and their transportation.
- Environmental impact of the use of fossil and nuclear resources.

Topic 4. Renewable energy resources: Solar energy

- The sun, elemental concepts of astronomy and solar position
- Fundamentals of thermal and photovoltaic generation
- Thermal solar systems (ACS, heating and industrial processes)
- The photovoltaic solar cell
- Photovoltaic technologies
- Photovoltaic systems
- Dimensioning of solar energy systems

Topic 5. Renewable energy resources: Other sources of renewable energy.

- Wind power
- Sea tide energy
- Geotermic energy
- Other renewable energy sources.
- Environmental impact of the use of renewable energy resources

Topic 6. Characterization of renewable energy resources

- Capacity and energy potential of the different energy resources.
- Relations between resources used and energy obtained.

Methodology

The development of the subject is based on four actions:

1) Master classes

Exposure of the concepts , principles and relations of each topic
Approach examples illustrating the application

2) Problem resolution classes

Discussion and resolution of problems and applications related to the concepts of each topic

The proposed problems are basically those of the subject collection of problems

3) Lab

Practical demonstration of the concepts reached

4) Work

Group work and oral presentation

Development plan

Week	Methodology	Topic	Lecture hours	Autonomous work hours
1	Master class. Problems.	T1	4	6
2	Master class. Problems.	T2	4	6
3	Master class. Problems.	T2/T3	4	6
4	Master class. Problems.	T3	4	6
5	Master class. Problems.	T4	4	6
4	Master class. Problems.	T4	4	6
7	Master class. Problems.	T4	4	6
8	Master class. Problems.	T4	4	6
6		Evaluation. Written exam, topics 1-4		
10	Master class. Problems.	T4	4	6
11	Master class. Problems.	T5	4	6
12	Master class. Problems.	T5	4	6
13	Master class. Problems.	T5	4	6
14	Master class. Problems.	T6	4	6
15	Master class. Problems. Group work	T6	4	6
14		Evaluation. Written exam, topics 4-6.		
17				
18		Tutoring period		

Evaluation

Exams :

1st exam (30%) , will be held in the ordinary period.

2nd exam (40%) , will be held in the ordinary period.

Recovery exam (70%) , will be held in the ordinary period.

Lab (15%).

Group work (15%) . It will be held in pairs and delivered / exposed at the end of the course .

Bibliography

Twidell, J. . Renewable Energy Resources.(2015) London: Routledge.

Tushar K. Ghosh; Mark A. Prelas. Energy Resources and Systems. (2009 vol1, 2011 vol2) Springer.

Paul Breeze; Aldo Vieira et all. Renewable Energy Focus Handbook. (2009). Elsevier.

Martin Kaltschmitt; Wolfgang Streicher; Andreas Wiese. Editors. Renewable Energy, Technology, Economics and Environment. (2007). Springer.

Ibañez, M., Rosell, J.R., Rosell, J. I. Tecnologia Solar. (2005). Mundiprensa.