



Universitat de Lleida

DEGREE CURRICULUM
**ENVIRONMENT
TECHNOLOGIES AND
SUSTAINABILITY**

Coordination: CHEMISANA VILLEGAS, DANIEL

Academic year 2020-21

Subject's general information

Subject name	ENVIRONMENT TECHNOLOGIES AND SUSTAINABILITY			
Code	102118			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Mechanical Engineering	2	COMPULSORY	Attendance-based
	Bachelor's Degree in Automation and Industrial Electronic Engineering	2	COMPULSORY	Attendance-based
	Master's Degree in Industrial Engineering	1	COMPLEMENTARY TRAINING	Attendance-based
	Bachelor's Degree in Energy and Sustainability Engineering	2	COMPULSORY	Attendance-based
	Not informed	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	6	5	2
Coordination	CHEMISANA VILLEGAS, DANIEL			
Department	ENVIRONMENT AND SOIL SCIENCES			
Important information on data processing	Consult this link for more information.			
Language	English 95 % Spanish 5%			
Distribution of credits	Chrysovalantou Lamnatou Daniel Chemisana Villegas			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
CHEMISANA VILLEGAS, DANIEL	daniel.chemisana@udl.cat	1	
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SOLANS BARÓN, ALEJANDRO	alejandro.solans@udl.cat	2,88	

Subject's extra information

The subject belongs to the module of "formation common to the industrial branch"

Learning objectives

- Check the basic rules related to the environment to extract from it the legal requirements applicable to pollution control in industry
- Plan, at a basic level, a strategy of prevention and control of pollution in specific cases in the industry susceptible
- Learn to distinguish which are the essential elements of a complex system, and maintain its modelling only the essential
- Acquire skills to design useful models in the Environmental Sciences
- Derive and present the requirements set forth in the problems
- Construct formal mathematical models to synthesize a problem situation
- Select the most appropriate waste management and / or pollution control facilities sizing and simple effluent treatment

Competences

University of Lleida strategic competences

- **UDL4.** To respect the fundamental rights of equality between men and women, the promotion of the Human Rights and the principles of a culture of peace and democratic values.

Degree-specific competences

- **GEM16 / GEEIA16.** Basic knowledge and application of environmental technologies and sustainability.

Degree-transversal competences

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

Subject contents

1. Environment

Atmosphere and climate

Natural cycles: water, carbon, nitrogen and phosphorous

Fluxes of matter and energy in ecosystems

Production, consumption and use of energy

2. Wastes

Types of waste

Treatment technologies

Final treatments

3. Pollution

Water pollution

Air pollution

Soil/groundwater pollution

Thermal pollution

Noise pollution

Light pollution

4. Environmental impacts

Types of environmental impacts considered

Environmental impacts of industrial activities

Economic growth and the environment

Environmental costs

Global Climate Change – Phenomena

Natural hazards (risks)

Energy Sources: non-renewable, renewable

Renewable Energy Sources Technologies

Life Cycle Assessment (LCA)

5. Sustainable development

Strategies for sustainable development

Environmental Sustainability

The role of renewable energy sources

Economic Sustainability

Sustainable Agriculture

Environmental regulations

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	Topic 1. Environment Topic 2. Wastes	4	6
2	Master class Problems	Topic 3. Water pollution	4	6
3	Master class Problems	Topic 3. Water pollution	4	6
4	Master class Problems	Topic 3. Water pollution	4	6
5	Master class Problems	Topic 4. Environmental impacts Topic 5. Sustainable development	4	6
6	Master class Problems	Topic 3. Noise pollution	4	6
7	Master class Problems	Topic 3. Air pollution and other types of pollution	4	6

8	Master class Problems	Topic 3. Air pollution and other types of pollution	4	6
9		Evaluation. Written exam, topics 1-3 (water poll.)		
10	Master class Problems Practice	Topic 3. Noise pollution. Practice about noise pollution.	4	6
11	Master class Problems Practice	Topic 4. Environmental impacts. Practice about LCA.	4	6
12	Master class Problems Practice	Topic 3. Light pollution. Practice about light pollution.	4	6
13	Problems	Exercises related with the topics	4	6
14	Group work	Presentations of the works of the students	4	6
15	Group work	Presentations of the works of the students	4	6
16		Evaluation. Written exam, topics 3 (except water poll.)		
17		- 5		
18		Tutoring period		
19		Recovery exams		

Evaluation

Exams:

1st part (25%), it will take place in the regular dates.

2nd part (35%), will take place in the regular dates.

Recovery (60%), will take place in the regular dates.

Laboratory (15%), Experiments complementary to the topics. You need to have approved practices to pass the subject.

Group work (25%). It will be held in groups of up to 4 people and will be delivered / expose at the end of the course.

Bibliography

Arya,S. Pal. "Air Pollution, Meteorology and Dispersion". Oxford U.Press. 1999

Callow,P. "Handbook of Environmental Risk Assessment and Management". Oxford: Blackwell Science. 1997

- Guyot,G. "Physics of the Environment and Climate". Wiley. 1998
- Harte,J. "Consider a spherical cow". University Science Books. 1998
- Harte,J. "Consider a cylindrical cow". University Science Books. 2001
- Masters,G.M. "Environmental Engineering and Science" Prentice Hall. 1998.
- TurcotteD.L. and Schubert G. "Geodynamics" Cambridge.2002.
- KIELY. "Ingeniería Ambiental". McGraw-Hill.
- HERNANDEZ, A. "Depuración de aguas residuales". CICCIP.Madrid.1994.
- TCHOBANOUGLOUS. "Gestión integral de residuos sólidos".McGraw-Hill.
- RAU,J.G.,WOOTEN,D.C. "Environmental Impact Analysis Handbook".
- DEGREMONT. "Manual técnico del agua".
- STERN, A.C. "Air Pollution". AcademicPress.8º Vol. 1986.
- RECUERO,M. "Ingeniería Acústica". UPM.1991.ISBN:84-404-8493-3.
- "Legislación Ambiental de Catalunya". Vol.: 3. Generalitat deCatalunya. Departament de Medi Ambient.
- MOPU. "Evaluaciones de Impacto ambiental". Dirección General delMedio Ambiente. 1984.