Environmental Management of Energy and Resources

Code: 106935
ECTS Credits: 6

2024/2025

Degree	Type	Year
2503743 Management of Smart and Sustainable Cities	FB	2

Contact

Name: Genis Riba Sanmarti

Email: genis.riba@uab.cat

Teaching groups languages

You can view this information at the end of this document.

Prerequisites

As it is a first year course, it is not obligatory to have taken any course previously. In any case, in order to take this course, it is necessary:

- Written and oral communication skills;

- Intermediate level of Catalan, Spanish and English, which allows written and auditory comprehension in the three languages, and

- Intermediate level of office automation -MS Office or other free softwares - especially in managing spreadsheets, texts and presentations.

Objectives and Contextualisation

The course has a dual objective. On one hand, it aims to provide basic knowledge about the economic, social, and territorial context in which energy and resource management systems operate in advanced societies. On the other hand, the course also aims to acquaint students with different instruments and mechanisms for resource management and planning.

Regarding the first objective, the course starts with an introductory approach to the socioeconomic and territorial elements that affect systems with a high level of technical complexity, such as energy and resources. Thus, it is considered that the configuration and evolution of these systems are not solely due to technical or technological components but are clearly conditioned by various issues such as the legal and administrative framework, the impositions and requirements of the urban and territorial environment in which they operate, the economic structure of each sector, the geopolitical framework and the functioning of the global economy, consumption patterns and population demands, or the level of societal awareness of the impacts of this consumption. In this regard, understanding the logic of these socioeconomic and territorial elements is fundamental to interpreting the development possibilities of a particular energy or resource model successfully. This first objective is addressed in the first part of the course, which mainly focuses on the energy area to thoroughly address each of these issues. Thus, after a geographical and historical contextualization of energy, the components of an energy system are detailed, followed by a description of the functioning of energy

markets based on the three main groups of agents that integrate them: suppliers, consumers, and the administration. Finally, some of the impacts of the current energy model on our society are described, and solution proposals based on planning are provided.

As for the second objective, acquiring a global vision of environmental management will provide students with fundamental concepts of sustainability, as well as mechanisms and public policies to promote sustainable behaviors at all levels. Methods for measuring sustainability and their application in resource management will be introduced.

Learning Outcomes

1. CM12 (Competence) Apply innovative solutions to solve urban planning problems in the context of professional practice.
2. KM16 (Knowledge) Analyse the urban environment from the point of view of the Circular Economy and Sustainability.
3. SM16 (Skill) Modelling the planning and management of services and infrastructures in relation to energy, the water cycle, atmospheric pollution and waste.

Content

Block 1: Energy

- Geographical context of energy
- Historical context of energy
- Energy systems: definition, components and requirements
- The role of the Administration and Planning: the EU, the State, the regional and local governments
- Energy supply: petroleum products, natural gas and electricity
- The functioning of the market for gas, electricity and petroleum fuels
- Energy consumption: characteristics and determinants
- Territorial and social conflicts
- Energy transition

Block 2: Environmental Management

- Sustainability
- Life cycle analysis
- Sustainable Cities
- Tools (mandatory and voluntary) to improve sustainability
- Urban Waste management
- Circular Economy

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			

Classroom exercises (practical)	30	1.2	CM12, KM16, SM16
Lectures	30	1.2	KM16, SM16
Type: Supervised			
Conducting practical excercises	30	1.2	CM12, KM16, SM16
Oriented readings	10	0.4	KM16
Type: Autonomous			
Information search	6	0.24	KM16
Reading and individual study	10	0.4	KM16, SM16

The subject will be structured around two main classroom activities, theory classes and practical exercises. The practical exercises, carried out with a computer, will provide the students opportunity to practice how to look for information, and select, treat, analyse and represent data on the subjects explained in the theory class. It is aimed to follow the evolution of each student in the understanding and use of the tools applied in the subject.

Apart from the directed activities, the students will have to spend time outside the classroom to complete those practical exercises not finished in classes, as well as to carry out the recommended readings for each topic.

During the theory classes, students will ask open-ended questions that will allow them to demonstrate their creativity, initiative and sensitivity towards social and environmental issues (T02).

In order to carry out the practical exercises successfully, innovative and competitive proposals must be generated in the professional activity (T03). At the same time, the realization of practical exercises will allow to generate proposals to prevent and to solve problems, adapting to unforeseen situations and to take decisions (T04).

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exam Energy Block	25%	1	0.04	CM12, KM16, SM16
Exam Environmental Management Block	20%	1	0.04	CM12, KM16, SM16
Participation	5%	2	0.08	KM16
Practices / Projects	50%	30	1.2	CM12, KM16, SM16

The evaluation of the course will be carried out progressively and continuously throughout the semester. The evaluation system is based on the following learning evidences:

- The presentation of reports, both written and oral, related to computer practices, problems, or case studies worked on during the course, with the objective of tracking each student's progress in understanding and using the tools covered in the course. The presentation of reports will allow us to assess the ability to generate innovative and competitive proposals in professional activities (T03) as well as the ability to prevent and solve problems by adapting to unforeseen situations and making decisions (T04).
- A midterm exam and a final exam (in case of re-evaluation), to support the consolidation of all the material covered during the course.

Evaluation Criteria

The final grade will be calculated based on the two midterm exams and the practical work grade. Class participation will also be taken into account through the professor's assessment and class exercises.

FinalGrade = 25% Energy Module Grade (First midterm) + 20% Environmental Module Grade (Second midterm) + 50% Practices + 5% Participation

In grading exams and reports, aspects such as presentation of the exam, writing quality, and basic errors will be considered, adjusting, if necessary, the final grade obtained from the weighted average of each score.

A necessary condition for the weighted sum is that the practical work must be passed (implying that all practical work must be completed) and that the exam grades must be equal to or greater than 5. It is important to note that the practical work must be completed and submitted on the dates specified by the course instructor, as they cannot be made up later.

Re-evaluation

For students who, at the end of the evaluation process, have not obtained a grade equal to or greater than 5 on the exams but have a grade higher than 5 on the practical work, there will be a re-evaluation. This will consist of an exam, scheduled by the Faculty in the last week of the semester, representing the situations covered during the course. Students will only have to retake the theoretical part they did not pass in the midterm exams. For repeat students, the theory grade for the parts passed will not be carried over to the next year. However, the practical work grade will be carried over from one year to the next.

With honors

Awarding an honors mark (MH) is the decision of the faculty responsible for the subject. UAB regulations indicate that MHs may only be awarded to students who have obtained a final grade equal to or greater than 9.00. Up to 5% MH of total enrolled students can be awarded.

Not eligible for evaluation

A student who has not taken an exam is considered "non-assessable". Otherwise, the evaluation criteria detailed above are followed.
Plagiarism or irregularities in the evaluation of the subject

Without prejudice to other disciplinary measures deemed appropriate, and in accordance with current academic regulations, irregularities committed by a student thatmay lead to a variation of the grade in an evaluable activity will be graded with a zero (0). Evaluation activities rated in this manner and by this procedure will not be recoverable. If it is necessary to pass any of these evaluation activities in order to pass the course, this course will be suspended directly, without the opportunity to recover it in the same course. These irregularities include, among others:

- the total or partial copy of a practice, report, or any other evaluation activity;

- allow copying;

- present a group work not done entirely by the members of the group (applied to all members, not just those who have not worked);

- present as their own materials produced by a third party, even if theyare translations or adaptations, and in general work with elements that are not original and exclusive to the student;

- have communication devices (such as mobile phones, smart watches, camera pens, etc.) accessible during individual theoretical-practical assessment tests (examinations);

- talk to colleagues during individual theoretical-practical assessment tests (examinations);

- copy or attempt to copy other students during theoretical-practical assessment tests (examinations); - use or attempt to use subject-related writings during the theoretical-practical assessment tests (examinations), where these have not been explicitly permitted.

In case of not passing the subject due to the fact that some of the evaluation activities do not reach the minimum required grade, the student will be graded the lowest value between 4.5 and the weighted average of the grades. Students who do not participate in any of the evaluation activities will be awarded the grade of "Not Evaluable", and also "Not Evaluable" is given to those that has grade lower than 3.0 and the weighted average of the grades, in case the student has committed irregularities in an evaluation act (and therefore there will not be any compensation or recoveryexam for this case). In future editions of this subject, the student who has committed irregularities in an act of evaluation will not validate any of the evaluation activities carried out.

In summary:copying, letting copy or plagiarize (or attempting to) in any of the evaluation activities result in a SUSPENSE, not compensable and without validation of parts of the subject in subsequent courses.

Bibliography

Block 1: Energy

General reading

- Abramsky, k. (Ed.). 2010. *Sparking a Worlwide Energy Revolution: Social struggles in the transition to a postpetrol world.*Edinburgh: AK Press.
- Boyle, G. (Ed.). 2007. *Renewable electricit & the grid: the challenge of variability*. London: Earthscan Publications.
- Droege, P. (Ed.). 2009. *100% renewable: energy authonomy in action*. London: Earthscan.
- Fernández, R. y González, Luis (214): *En la espiral de la energía*. Madrid: Libros en Acción.
- Gore, A. 2007. *Una verdad incómoda: la crisis planetaria del calentamiento global y cómo afrontarla*. Barcelona Gedisa editorial.
- Greenpeace. 2007.*Renovables 100%: un sistema eléctrico renovable para la España peninsular y su viabilidad económica*. Madrid: Geeenpeace
- Hildyard, Nicholas, et al. 2014.*Seguridad energética ¿para qué? ¿para quien?.*Libros enAcción & The Corner House.
- Hopkins, R. 2008.*The transition handbook: from oil dependency to local resilience*. Vermont: Chelsea Green.
- Iraegui, J. I Ramos, J. 2004. *Gestió local de l'energia*. Barcelona: Fundació Pi i Sunyer
- La Vanguardia. 2014. *"La geopolítica de la energía*."*Dossier Vanguardia*Núm 53. Octubrediciembre 2014.
- Le Monde Diplomatique. 2014. "Batallas por la Energía". *Atlas de Le Monde Diplomatique*. Diciembre 2014.
- Patterson, W. 2007. *Keeping the light son: towards sustainable electricity*. London: Earthscan.

- Puig, J. 2004. "Prospectiva energética. Els contorns d'un nou model energetic I el processde transició". A: *La tecnología: llums i ombres*.Informe 2004 de l'Observatori del Risc. Barcelona: Institut d'estudis de la seguretat.
- Puig, J. I Corominas, J. 1990.*La ruta de la energía*. Barcelona: Anthropos.
- Riba, C. 2011. *Recursos energètics i crisi. La fi de 200 anys irrepetibles*. Barcelona: Universitat Politècnica de Catalunya.
- Sans, Ramon. 2014. *El col·lapse és evitable. La transició energètica del segle XXI (TE21*). Ediciones Octaedro.
- Romero, Cote i Barcia Magaz (eds.). 2014. *Alta tensión. Por un nuevo modelo energético sostenible, democrático y ciudadano*. Icaria.
- Ruiz, Valeriano, 2006. *El reto energético*. Almuzara
- Scheer, H. 2011.*Imperativo energético*. Barcelona: Icària
- Starke, L. (Ed.). 2009. *L'Estat del Món 2009. El planeta s'escalfa*. Informe del Worldwatch Institute sobre el progres cap a una societat sostenible. Barcelona: Centre UNESCO de Catalunya.
- The Economist. 2015.*Let there be light. Sepcial report on energy and technology*. January 17th 2015
- The Worldwatch Insititute. 2016. *Can a City Be Sustainable?.*State of the World. Washington.

Block 2: Environmental Management

- Göran Finnveden, Michael Z. Hauschild, Tomas Ekvall, Jeroen Guinée, Reinout Heijungs, Stefanie Hellw, 2009, Recent developments in Life Cycle Assessment, , 91: 1-21
- Sonnemann G, Castells F, Schuhmacher M, 2004 Integrated Life-Cycle and risk assessment for industrial processes, Lewis Publishers
- Riera P ,2000 Avaluació d'impacte ambiental , Departament de Medi Ambient, Generalitat de Catalunya
- Conesa, V., 2010, Guía metodológica para la evaluación del impacto ambiental, Ed. Mundi-prensa, 4a Ed.
- A banda deles lectures generals, per a cada tema es recomanaran dues o tres lectures o vídeos específics.

Software

MS Excel

Language list

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	1	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	2	Catalan	first semester	morning-mixed
(TE) Theory	1	Catalan	first semester	morning-mixed