UAB
Universitat Autònoma de Barcelona

Dynamics of Water, Energy and Natural Resources

Code: 104253
ECTS Credits: 6

2025/2026

Degree	Type	Year
Geography, Environmental Management and Spatial Planning	OB	3

Contact

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Teachers

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Teaching groups languages

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

Prerequisites

Students must have a sufficient level of English to understand scientific texts in this language.

Objectives and Contextualisation

This is a compulsory subject of 6 ECTS corresponding to the third year of the Degree in Geography, Environment and Territorial Planning; located in the material "Planning and management of natural resources". The subject offers general knowledge on the topic with the possibility of deepening it through the optional subjects that the study plan contemplates in it.

The subject focuses, first of all, on tracing a conceptual and theoretical approach to the question of the use and management of natural resources and the debate on the limits of growth. Next, two areas of particular importance in relation to resources are addressed in more detail: the planning and management of the water cycle and the planning and management of energy systems.

With this subject, students will gain general knowledge about the management and social use of natural resources and common goods. Thus, the dynamics of water, energy and natural resources are addressed both from the perspective of their uses (with special attention to reuse), and from the perspective of the different forms of management (offer- demand; public-private; centralized-decentralized). The subject, on the other hand, also aims for students to know different instruments and mechanisms for the management and planning of both water resources and energy resources.

In the field of water cycle management, the aim is for students to learn about its dynamics both from a physical and socio-economic point of view, with special attention to its environmental dimension. Also, the students will know and apply through practical work methods, techniques and instruments for the management of the water cycle.

In the field of energy, basic energy concepts are offered both in terms of energy sources (renewable and non-renewable) and in terms of planning and management of energy systems, both in terms of engineering environmental (generation, transport, distribution, commercialization and consumption of energy) as well as from the territorial, economic and institutional perspective.

Learning Outcomes

1. CM24 (Competence) Prepare a report on the planning and management of energy and/or water systems from a regional, economic, and institutional perspective.
2. KM39 (Knowledge) Identify the relationships between socio-economic development, environmental sustainability and the availability of and access to natural resources.
3. KM55 (Knowledge) Incorporate transversal thematic elements of the degree in the final project.
4. SM31 (Skill) Analyse the limits of growth based on the relationships between socio-economic development, environmental sustainability and availability and access to natural resources.
5. SM31 (Skill) Analyse the limits of growth based on the relationships between socio-economic development, environmental sustainability and availability and access to natural resources.

Content

Block I - Introduction to the management of natural resources

- Natural resources as common goods: governance models
- The production and use of natural resources in today's world: efficiency and limits to growth

Block II - The water cycle

- The water cycle and socio-environmental problems
- Legal framework and planning instruments
- The large supply infrastructures
- Water in the rural world: ecosystems, food and energy
- The urban uses of water and its local management
- Water and risk: drought and floods
- Water-energy nexus

Block III - Energy systems

- History and Geography of the uses of energy
- Energy systems: definition, components and requirements
- Planning and management of energy systems
- Conflicts around energy
- The change of energy model

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field trip (PLAB)	4	0.16	CM24, KM39, KM55, CM24
Practices (PAUL)	12	0.48	CM24, KM39, KM55, SM31, CM24
Teorethical lessons	27	1.08	KM39, KM55, SM31, KM39
Type: Supervised			
Practical and fieldtrip exercices	15	0.6	
Preparation of activities	5	0.2	
Tutorships	5	0.2	
Type: Autonomous			
Information research	15	0.6	
Personal study	35	1.4	
Reading	25	1	

The subject is divided into three blocks. In the first block includes an introduction to the management of natural resources. In the second block, the planning and management of the water cycle will be addressed. In the third block, the management of energy systems will be addressed.

The teaching activities of the subject will be structured as follows:

Theory classes

The following activities will be carried out in the face-to-face theory sessions:

Lectures: presentations by the teaching staff encouraging debate and student participation.
Exercises aimed at the classroom: exercises based on the active participation of the students (usually through informal cooperative work) that will not require previous work.
Cooperative work with preparation. Different formal cooperative work activities will be carried out based on the previous work of the students (readings or preparation of the activity). Some of these activities may require oral presentations by the students.

Classroom practices

A total of 7-8 practice sessions will be held in the classroom (2 in the natural resources block, 2 in the water block and 5 in the energy block).

The teaching staff responsible for the practicals in the classroom will conveniently inform about the practical activity to be carried out in each session. As a result of these activities, the students will have to complete different assignments of practical exercises.

Field trip

There will be a field trip that will be specified at the beginning of the course. Attendance is an essential requirement for the course.

After the field trip, the students will be asked to submit a report. The teaching staff will detail the contents and requirements of the same.

Field trips will be conducted in accordance with the official Field Trip Protocol established by the Faculty. Students will be provided with specific safety documentation related to off-campus activities organized by the Universitat Autònoma de Barcelona (UAB). It is the responsibility of each student to review and acknowledge this documentation prior to participating in any field activity.

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
Exams	40%	3	0.12	KM39, KM55, SM31
Field trip report	20%	0	0	CM24, KM39, SM31
Practices and reports	30%	0	0	CM24, KM39, SM31
Theory deliveries and activities	10%	4	0.16	CM24, KM39, KM55, SM31

The evaluation of the subject is based on:

- 2 partial exams (one covering block 1 and 2, and another one on block 3): 40% (20% each exam)
- Practical exercises resulting from classroom practices (PAUL): 30%
- Field trip report (PCAM): 20%
- Participation in theory sessions (TE): 10%

The final mark will come from the weighted average of the four activities. To pass the subject you must have passed (5) each of the three partial exams and the average of the practical exercises (PAUL).

The grade corresponding to the participation in the theory sessions (TE) will be obtained through different deliveries (individual or group) corresponding to the various activities that the teaching staff may propose during the development of these sessions (debates, summaries, cooperative work, oral presentations...) Some of these activities may require prior preparation. Participation in these activities is not mandatory; however, in those activities that are not attended, the grade will be zero (0), with no possibility of making the delivery at any other time.

The evaluation of the field trip will be done by a report. To approve the subject, it is mandatory to attend the field trip and hand in the corresponding report.

Exam Scheduling and Assignment Submission

Exam and assignment submission dates will be communicated to students well in advance and cannot be modified individually (except in exceptional and duly justified cases). Erasmus students requesting to take an exam early must present a written document from their home university justifying the request.

The resit exam date will be set by the Faculty of Philosophy and Arts and is non-negotiable.

Grade Review

At the time of each evaluative activity, the instructor will inform students (viathe Virtual Campus) of the procedure and date for grade review.

Resit

To be eligible for resit, students must have been previously assessed in activities that account for at least two-thirds of the total grade.

The three exams and the practical exercises (PAUL) can be retaken, provided the original grade was below 5. The assignments from the theory sessions (TE) and the field trip report are not eligible for resit. The maximum grade for resit activities is 5.

Any evaluative activity involving irregularities is not eligible for resit.

Single Assessment

This course does not offer a single assessment option.

Non-Assessable Students

Students will be considered "non-assessable" if they have not completed and submitted the exam and/or the field trip report.

Unsubmitted activities will receive a grade of zero (0).

Plagiarism or Fraudulent Conduct

If a student commits any irregularity that may significantly affect the grade of an evaluative activity, that activity will be graded with a 0, regardless of any disciplinary proceedings that may follow. If multiple irregularities occur in the same course, the final grade for that course will be 0.

Use of Artificial Intelligence

Restricted use: In this course, the use of AI technologies is allowed only for support tasks such as bibliographic or information searches, or text correction. Students must clearly identify which parts were generated using AI, specify the tools used, and includea critical reflection on how these tools influenced the process and final outcome of the activity. Lack of transparency in the use of AI in an evaluative activity will be considered academic dishonesty and may result in partial or total penalties on the grade, or more severe sanctions in serious cases.

Bibliography

For each topic, one or more recommended readings will be indicated. Additionally, several readings will be analyzed in class.

Natural Resources Management

- Conroy, Michael J..; Peterson, James.T. 2012. Decision Making in Natural Resource Management: a structured, adaptive approach. Hoboken: Wiley-Blackwell

- D'Alisa, Giacomo.; Demaria, Federico.; Kallis, Giorgos. 2015. Decreixement: vocabulari per a una nova era. Barcelona: Editorial Icària.
- Folch, Ramon. 2019. Natura, ús o abús? (2018-2019). Barcelona: Institut d'Estudis Catalans.
- Kaika, Maria. 2005. City of flows. Modernity, nature and the city. London: Routledge.
- Laval, Christian, Dardot, Pierre P. 2015. Común: ensayo sobre la revolución en el siglo XXI. Barcelona: Gedisa.
- Ostrom, Elinor. 2000. El gobierno de los bienes comunes: la evolución de las instituciones de acción colectiva. México: Fondo de Cultura Económica.
- Polimeni, John M. et al. 2009. The Myth of Resource Efficiency: the Jevons Paradox. Florence: Taylor and Francis.
- Whitehead, Mark 2007. Spaces of sustainability. Geographical perspectives on the sustainable society. London: Routledge.
- Valero Delgado, Alicia et al. (2021). Thanatia. Límites materiales de la transición energética. Prensas de la Universidad de Zaragoza

Water

- Meehan, Katie et al. 2023. Water: A Critical Introduction. : John Wiley & Sons
- Bakker, Karen 2010. Privatizing Water. Governance Failure and the World's Urban Water Crisis. Ithaca, NY: Cornell Univ. Press
- Boelens, Rutgerd et al. (eds). 2018. Water Justice. Cambridge: Cambride UniversityPress.
- Estevan, Antonio; Naredo, José Manuel 2004. Ideas y propuestas para una nueva política del agua en España. Bilbao: Bakeaz.
- Gandy, Mattew 2014. The fabric of Space. Water, Modernity and the Urban Imagination. Cambridge MA: The MIT Press
- Relea, Ferran et al. 2021. Aigua 3.0 a Catalunya. Una visió calidoscòpica. Girona: Curbet Edicions.
- Sanjuán, Marc 2005. Gestió local de l'aigua. Barcelona: Fundació Pi i Sunyer.
- Sedlak, David. 2014. Water 4.0. NewHaven, Conn: Yale University Press
- Sultana, Farhana; Loftus, Alex (eds). 2012. The Right to Water. Politics, governance and social struggles. London: Earthscan.
- Swyngedouw, Eric 2015 Liquid Power. Contested Hydro-Modernities in Twentieth Century Spain. Cambridge, MA: The MIT Press

Energy

- Abrasmky, Kolya. (Ed.). (2010). *Sparking A Worldwide Energy Revolution. Social Struggles in the Transition to a Post-Petrol World*. Edinburgh: AK Press.
- Azcárate, Blanca., & Montesa, Ferrán. (2014). *Batallas Por la Energía. Atlas Le Monde Diplomatique*. Cybermonde.
- Boyle, Godfrey. (Ed.). (2012). *Renewable Energy: Power for a Sustainable Future* (3rd ed.). Oxford: Oxford University Press and Open University.
- Corominas, Joaquim. (2019). El model energètic. In *NATURA, ÚS O ABÚS? (2018-2019)* (3rd ed.). https://doi.org/10.2436/15.0110.22.7
- Del Romero Renau, Luis. (2023). *El arte de vivir en la Espana vaciada. Colonialismo energético, crisis climática y transición ecosocial*. FUHEM Ecosocial. https://www.fuhem.es/2023/03/31/el-arte-de-vivir-en-la-espana-vaciada/
- Droege, Peter. (Ed.). (2008). *Urban energy transition: from fossil fuels torenewable power*. Elsevier.
- Fernández, Ramon., & González, Luis. (2018). *En la espiral de la energía*. Madrid: Libros en Acción.
- Franquesa, Jaume. (2023). *Molinos y gigantes. La lucha por la dignidad, la soberanía energética y la transición ecológica* (E. Pérez San Miguel, Trad.). Errata nature editores.
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- Hopkins, Rob. (2008). The transition handbook: from oildependencyto local resilience. Vermont: Chelsea Green.
- Malm, Andreas . (2016). *Fossil Capital. The rise of steam power and the roots of global warming*. Verso.
- Prats, Fernando., Herrero, Yayo., & Torrego, Alicia. (Eds.). (2016). *La Gran Encrucijada*. Retrieved from https://blogs.fuhem.es/forotransiciones/wp-content/uploads/sites/51/2017/05/GranEncrucijada_feb2017_b
- Puig, Josep., & Corormінas, Joaquim. (1990). *La ruta de la energia*. Barcelona: Anthropos.

- Riba Romeva, Carles. (2022). *Itinerari energètic integral. Obtenció d'energia útil en un sistema renovable*. Octaedro
- Riba Sanmartí, Genís. (2016). El cost de l'energia, Barcelona, Octaedro.
- Romero, Cote i Barcia Magaz (eds.). (2014). Alta tensión. Por un nuevo modelo energético sostenible, democrático yciudadano. Icaria.
- Sans, Ramon., & Pulla, Elisa. (2014). *El col·lapse és evitable. La transició energèticadel segle xxi (TE21)*. Octaedro.
- Scheer, Hermann. (2011). *El imperativo energético 100% ya Cómo hacer realidad el cambio integral hacia las energías renovables*. Barcelona: Icaria Editorial.
- Smil, Vaclav. (2003). *Energy at the Crossroads. Global Perspectives and Uncertainties*. Cambridge: The MIT Press.
- Zamora Santa Brígida, Ignacio. (2022). *Regulando la transición energética. Hacia un modelo sostenible, flexible y distribuido*. València:Tirant lo Blanch.

Software

None specific beyond the one used during the first two years of the degree.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

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