Environmental Assessment and Environmental Footprint

Educational subject description sheet

Basic information

Field of study Joint Bachelor in Sustainability **Speciality** Environmental & Life Sciences **Organizational unit** Faculty of Law and Administration **Study level** first cycle (joint degree programme) **Study form** full-time degree programme **Education profile** General academic **Mandatory** obligatory	**Education cycle** 2025/26 **Subject code** UJ.WPAJBSELSS.8100.16553.25 **Lecture languages** english **Subject related to scientific research** Yes **Disciplines** Earth sciences and the environment, Biological sciences, Management science and quality **ISCED classification** 0521 Environmental sciences **USOS code**

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Lecturer	Miguel Ángel Casermeiro Martinez

Period	**Examination**	**Number of ECTS points**
Semester 5	exam **Activities and hours** Discussion class: 45	5.0

Goals

C1	Students will be able to assess environmental impacts at different decision-making scales according to the European Union recommendations.
C2	Students will be able to develop a specific mitigation program according to the Habitat Directive.
C3	Students will have the conceptual and expertise to understand and use Analysis of the life cycle as well as different ecological, carbon and water footprints.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	the most important concepts related to environmental assessment	JBS_K1_W01, JBS_K1_W07	written exam
W2	the administrative procedures and agents involved in Environmental Assessment related to decision-making.	JBS_K1_W05, JBS_K1_W06, JBS_K1_W07	written exam, report
W3	the different tools used in the specific decision making scales	JBS_K1_W03, JBS_K1_W04, JBS_K1_W05, JBS_K1_W06, JBS_K1_W07	written exam
W4	the whole aspects related to environmental assessment	JBS_K1_W03, JBS_K1_W04, JBS_K1_W06, JBS_K1_W07	written exam, report
Skills – Student can:			
U1	to assess the environmental impact at different scales, approaches and methodologies	JBS_K1_U02	written exam, report
U2	to select the most adequate methodology related to the type of activity	JBS_K1_U02, JBS_K1_U03	report
U3	to lead an evaluation team, integrating different disciplines and creating specific assessment reports	JBS_K1_U02, JBS_K1_U03, JBS_K1_U04	report
Social competences – Student is ready for:			
K1	to formulate a scientific and critical opinion about the issues related to Environmental Assessment practices	JBS_K1_K01, JBS_K1_K03, JBS_K1_K05	report
K2	encourage the practice of environmental assessment in any specific activity	JBS_K1_K01, JBS_K1_K02, JBS_K1_K03, JBS_K1_K05	report
K3	encourage and lead the processes of public participation under any environmental assessment approach	JBS_K1_K01, JBS_K1_K02, JBS_K1_K03, JBS_K1_K04, JBS_K1_K05	report

Calculation of ECTS points

Activity form	Activity hours*
Discussion class	45
preparation for classes	50
preparation for the exam	30
field studies	15

Student workload	Hours	ECTS
	140	5.0

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes
1.	Basis of environmental assessment. • Environmental quality. • Environmental resilience. • Impact assessment	W1, W2, W3
2.	Conceptual and regulatory framework. • European Context. (Directive 52/2014, Directive 42/2001) • Administrative procedures schemes. • The impact assessment statement.	W1, W3, W4
3.	Decision-making processes and environmental assessment tools • Decision-making at different levels. • Strategic Environmental Assessment (SEA), (policy, plans and programs) • Environmental Impact Assessment (EIA) (projects) • Other tools (Health impact Assessment, Risk Assssessment)	W1, W2, W3, W4, U1, U2, U3, K1, K2, K3
4.	Methodologies for environmental assessment I. • First-level methods (qualitative methods): Cheek list, ordination matrix, flow diagrams, Delphi method. • Quantitative approaches, the use of standards in Environmental assessment. • Application to different case studies.	W1, W2, W3, W4, U1, U2, U3, K1, K2, K3
5.	Methodologies for environmental assessment. Ad hoc methods • Modelling of Environmental Impact Assessment. • SIG application. • Examples of different case studies.	W1, W2, W3, U1, U2, U3, K1, K2, K3

No.	Course content	Subject's learning outcomes
6.	Mitigation measurements and monitoring program. Implementation of Article 6 of the Habitats Directive. • Organization of a monitoring program. • The provisions of Article 6. • Ecological requirements • Setting site-level conservation objectives	W1, W2, W3, W4
7.	Case studies in different countries I. Examples of SEA in specific plans and programs, • Urbanization • Forestry • Agriculture • Energy.	W1, W2, W3, W4, U1, U2, U3, K1, K2, K3
8.	Case studies in different countries II. Examples of Environmental impact Assessment in specific projects. • Road construction projects. • Solar plant project. • Irrigation project • Energy transmission project.	W1, W2, W3, W4, U1, K1
9.	Other Environmental Assessment tools: • Risk Impact Assessment. • Health Impact Assessment. • Social and cultural impact assessment	W3, W4, U1
10.	Ecological footprint I, carbon footprint and water footprint • Basis of the establishment of footprints. • Carbon footprint • Water footprint (although the main focus will be on carbon footprint) • Ecological footprint.	W3, W4, U1

No.	Course content	Subject's learning outcomes
11.	Ecological footprint II, methodologies: • ISO 14067 for carbon footprint. • GHG Protocol. • Water Footprint, Network for water footprint, etc	W3, W4, U1
12.	Ecological footprint III. • GHG emission trajectories. • Carbon markets and policies (NetZero, SBTi, CDP, Carbon credits	W2, W3
13.	Life Cycle Assessments (LCA) I: Introduction and methodologies for LCA. • Evaluation using ISO 14040, cycle assessment (LCA) studies and life cycle inventory. • Evaluation using ISO 14044, goals and scope for LCA.	W1, W2, W3, W4, U1, K1
14.	Life cycle assessments II: • Product Environmental Footprint and Organization Environmental Footprint (PEF and OEF Methodology). • LCA from European Commission. • Tools to make LCA: commercial databases and software (ECOINVENT, SIMAPRO, etc.).	W1, W2, W3, W4, U1, K1
15.	New trends in sustainability for companies and environmental labels. • Biodiversity footprint (GBS Score, Biodiversity Net Gain, TNFD); • Climate Adaptation (Risks and Opportunities) (TCFD, CDP); CSRD Directive	W1, W2, W3, W4, U1, K1

Course advanced

Teaching methods :

text analysis, conversation lecture, case study, practicals, ćwiczenia terenowe

Activities	Examination methods	Credit conditions
Discussion class	written exam, report	Written exam based on open and multiple-answer questions (graded). Report of specific questions and a report of the main impacts explained in the field trip, including the BAT (Best Applied Technology) used for impact mitigation.

Entry requirements

None

Literature

Obligatory

1. Abaza, H., Bisset, R., Sadler, R. (2004). Environmental Impact Assessment and Strategic Environmental Assessment: Towards an Integrated Approach. United Nations Environmental Program. 147 pp.
2. Carroll,B.; Fothergill, J.; Murphy, J. & Turpin. T. (2019) Environmental Impact Assessment Handbook: A practical guide for planners, developers and communities, Third edition. ICE Publishing.
3. Hundloe, T. (2021). Environmental Impact Assessment: The Awakening. In: Environmental Impact Assessment. Palgrave Studies in Environmental Policy and Regulation. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-80942-3_1
4. Fischer, T, & González, A. (2021). Handbook on Strategic Environmental Assessment. Edward Elgar Publishing.
5. Otero Pastor, I; Casermeiro, M.A; Ezquerra, A.; Esparcia, P. (2007) Landscape evaluation: Comparison of evaluation methods in a region of Spain. Journal of Environmental Management. Vol. 85 Issue 1 Pages 204-214. DOI: https://doi.org/10.1016/j.jenvman.2006.09.018
6. J. Glasson and R. Therivel (2013). Introduction to environmental impact assessment. Publisher: Routledge.
7. Leopold, L. B. (1971). Procedure for evaluating environmental impact. Vol. 645. US Department of the Interior.
8. M. R. Partidário. (2000) Elements of an SEA framework— improving the added-value of SEA. Environmental Impact Assessment Review Vol. 20 Issue 6 Pages 647-663. DOI: https://doi.org/10.1016/S0195-9255(00)00069-X
9. Wathern, P. (2013). Environmental impact assessment: theory and practice. Publisher: Routledge.
10. Morgan, R,K. . (2012) Environmental Impact Assessment: the state of the art. Impact Assessment and Project Appraisal Vol. 30 (1) Pages 5-14 DOI: 10.1080/14615517.2012.661557
11. Lobos, V. & Partidario, M.R. (2014). Theory versus practice in Strategic Environmental Assessment (SEA). Environmental Impact Assessment Review Vol. 48 Pages 34-46. DOI: https://doi.org/10.1016/j.eiar.2014.04.004

Effects

Code	Content
JBS_K1_K01	The graduate can encourage sustainability-driven practices in the workplace and appraise sustainability of own values, perceptions, roles, and actions, with a special focus on environmental wellbeing.
JBS_K1_K02	The graduate can demonstrate considerable entrepreneurial initiative, autonomy, and readiness to act in complex and changing environments, especially in the context of supporting, undertaking, and co-organising activities beneficial for a sustainable society.
JBS_K1_K03	The graduate can consider different visions of the future and develop own evidence-based opinions in reference to the balance of values linked to economic development, social welfare, and environmental protection.
JBS_K1_K04	The graduate can critically assess and verbalize own competencies and skills related to different aspects of sustainability as well as their need for development.
JBS_K1_K05	The graduate can defend the importance of scientific data and methods as a basis for decision-making.
JBS_K1_U02	The graduate can present and report knowledge, methodologies, ideas, problems and solutions, clearly and comprehensively, in different forms destined for different audiences – including discussions and debates which require defending a substantiated opinion, as well as conversations in a foreign language at the CEFR B2 level.
JBS_K1_U03	The graduate can apply adequate methods and tools, including selected IT tools, to solve problems related to data collection, analysis, and management in the context of sustainability.
JBS_K1_U04	The graduate can plan and effectuate simple sustainability-related projects under supervision and in the context of personal lifelong learning, both individually and in a team, using appropriate transversal skills and taking shared responsibility for the outcome.
JBS_K1_W01	The graduate can describe the concept of sustainability and recognize the differences in relevant definitions, models and approaches.
JBS_K1_W03	The graduate can give examples of sustainability-related dilemmas and hypothesize on the optimal course of action.
JBS_K1_W04	The graduate can identify sustainability-related problems specific to selected cultural, geographical, and political contexts.
JBS_K1_W05	The graduate can identify essential international instruments and institutions related to sustainability and explain their potential role in resolution of a given problem.
JBS_K1_W06	The graduate can describe interconnections between various aspects of sustainability and identify their significance in the context of natural and social sciences, with a special focus on disciplines included in the selected specialisation track (law and politics; chemistry and physics; chemistry and biology; economics and geography; economics, management and engineering; humanities).
JBS_K1_W07	The graduate can apply the theory and methodology of disciplines included in the selected specialisation track to sustainability-related problems, taking into consideration practical limitations such as protection of intellectual property.