Environmental Sustainability in the Field

Educational subject description sheet

Basic information

Field of study Joint Bachelor in Sustainability	**Education cycle** 2025/26
Speciality Environmental & Life Sciences	**Subject code** UJ.WPAJBSELSS.880.16547.25
Organizational unit Faculty of Law and Administration	**Lecture languages** english
Study level first cycle (joint degree programme)	**Subject related to scientific research** Yes
Study form full-time degree programme	**Disciplines** Biological sciences, Earth sciences and the environment
Education profile General academic	**ISCED classification** 0521 Environmental sciences
Mandatory obligatory	**USOS code**

Subject coordinator	Piotr Szwedo
Lecturer	Maria Isabel Benito Moreno, Jose Maria Esbri, Maria de la Luz Garcia Lorenzo, Beata Klimek, Pablo Suárez González

Period Semester 4	**Examination** graded credit **Activities and hours** Discussion class: 45	**Number of ECTS points** 5.0

Goals

C1	The course aims to provide an overview of environmental challenges in soil and water contamination, covering geochemical characterization methods, ecotoxicology, and hands-on fieldwork experiences including visits to mining sites contaminated by potentially toxic elements and the Mar Menor lagoon. In addition, the socio-economic impact of contamination in this touristic area will be analysed. Participants will learn about remediation techniques such as chemical approaches, acidity neutralization, and revegetation, with practical exercises. Group discussions and presentations will focus on successful remediation projects and future career paths in environmental sustainability and remediation.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	the major environmental issues associated with water and soil contamination	JBS_K1_W04	written credit, credit with grade
W2	geochemical characterization methods used at contaminated sites to identify pollution sources and dispersion routes	JBS_K1_W05	credit with grade, project
W3	the impact of eutrophication on aquatic ecosystems and associated environmental challenges	JBS_K1_W04	credit with grade, project
Skills – Student can:			
U1	develop practical skills in the field of ecotoxicology and environmental impact assessment	JBS_K1_U03	credit with grade, project
U2	acquire proficiency in handling portable analytical techniques and determining physicochemical parameters related to contamination	JBS_K1_U03	credit with grade, project
U3	enhance fieldwork skills through hands-on experience in conducting water quality assessments and soil sampling techniques	JBS_K1_U04	credit with grade, report
Social competences – Student is ready for:			
K1	to demonstrate critical thinking and problem-solving skills in assessing environmental risks, analyzing data, and proposing effective remediation solutions	JBS_K1_K03	credit with grade, project
K2	to demonstrate effective communication skills in presenting findings, discussing environmental issues	JBS_K1_K04, JBS_K1_K05	written credit, credit with grade, project
K3	to develop interdisciplinary perspectives by integrating knowledge from geology, geochemistry and environmental science to address environmental challenges	JBS_K1_K05	written credit, credit with grade, project

Calculation of ECTS points

Activity form	Activity hours*
Discussion class	45
preparation of a project	40
report preparation	45
preparation for the exam	20

Student workload	Hours	ECTS
	150	5.0

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes
1.	Introduction to Environmental Problems in Mining Activities and Soil Contamination	W1
2.	Geochemical Monitoring Methods for Contaminated Sites	W2
3.	Ecotoxicology and Environmental Impact Assessment	W1, W2
4.	Environmental Sustainability in Critical Raw Materials Production	W1
5.	Socio-economic Impact of Pollution Processes	K1
6.	Field Work and Hands-on Experience Field visit to an abandoned mining district for on-site observations Identification of pollution sources and dispersion routes through sedimentary processes Hands-on activities involving portable analytical techniques and physicochemical parameter determination	U1, U2, U3, K1, K2
7.	Remediation Techniques: Chemical Approaches and Acidity Neutralization Remediation strategies for addressing chemical contamination. Chemical neutralization techniques to mitigate acidity and reduce metal mobility. Case studies on successful remediation projects using chemical approaches	K1, K2
8.	Remediation Techniques: Revegetation and Ecosystem Restoration Importance of revegetation in stabilizing soil and promoting ecological recovery Selection of native species for mine site restoration Practical exercises on seed collection, propagation, and planting techniques	K3
9.	Field work and Hands-on Experience: Mar Menor Eutrophication Field visit to the Mar Menor to observe eutrophication issues Analysis of eutrophication causes and effects Hands-on activities related to water quality assessment Discussion on mitigation and restoration strategies for the Mar Menor	W3, U1, U2, U3
10.	Group Discussions and Presentations on Remediation Projects Group discussions on the challenges and successes of remediation projects Presentation of individual or group projects related to remediation techniques Peer feedback and constructive discussions on proposed solutions	K1
11.	Recap of key concepts and techniques covered in the course Discussion on the future of environmental sustainability and remediation Exploration of potential career paths and opportunities in the field	K1

Course advanced

Teaching methods :

conversation lecture, discussion, laboratories

Activities	Examination methods	Credit conditions
Discussion class	written credit, credit with grade, project, report	Written exam: 20%; Field notebook: 30%; Laboratory notebook: 25%; Project or assignment: 10%; Active participation: 10%; problem-solving assessment: 5%

Entry requirements

None

Literature

Obligatory

1. Materials provided by during the class and additional literature suggested by the lecturer

Effects

Code	Content
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_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_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.