

## Introduction to Environmental & Life Sciences

### Educational subject description sheet

#### Basic information

<p><b>Field of study</b> Joint Bachelor in Sustainability</p> <p><b>Speciality</b> -</p> <p><b>Organizational unit</b> Faculty of Law and Administration</p> <p><b>Study level</b> first cycle (joint degree programme)</p> <p><b>Study form</b> full-time degree programme</p> <p><b>Education profile</b> General academic</p> <p><b>Mandatory</b> obligatory</p>		<p><b>Education cycle</b> 2025/26</p> <p><b>Subject code</b> UJ.WPAJBSS.820.16348.25</p> <p><b>Lecture languages</b> english</p> <p><b>Subject related to scientific research</b> Yes</p> <p><b>Disciplines</b> Biological sciences, Earth sciences and the environment</p> <p><b>ISCED classification</b> 0520 Environment not further defined</p> <p><b>USOS code</b></p>	
<b>Subject coordinator</b>	Piotr Szwedo		
<b>Lecturer</b>	Jose Ignacio Aguirre, Gemma Palomar, Ana Payo Payo, Ángeles Garcia Mayor		
<b>Period</b> Semester 2	<b>Examination</b> exam	<b>Activities and hours</b> Lecture with elements of a discussion class: 36	<b>Number of ECTS points</b> 4.0

#### Goals

C1	To understand the principles of environmental and life sciences and scientific thinking.
C2	To be able to apply different methods (literature review, data processing and analytical thinking) to connect environmental and life sciences with sustainability and SDGs at different scales.
C3	To be ready to translate environmental and life sciences knowledge into sustainability policy and action.

## Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
<b>Knowledge - Student knows and understands:</b>			
W1	the fundamental principles of life and environmental sciences, including the levels of organisation of living systems and the unique properties that emerge from them.	JBS_K1_W06	written exam
W2	the scientific method and its importance in differentiating between data-driven conclusions and opinions.	JBS_K1_W06	written exam
W3	the interconnectedness of life on Earth and the complex relationships between life sciences and environmental issues.	JBS_K1_W05	written exam
W4	the process of translating scientific knowledge from environmental and life sciences into actionable policies and strategies for achieving sustainability.	JBS_K1_W01, JBS_K1_W02, JBS_K1_W03, JBS_K1_W04, JBS_K1_W05, JBS_K1_W06, JBS_K1_W07	written exam
<b>Skills - Student can:</b>			
U1	critically analyse information, differentiate between data and opinions, and assess the level of uncertainty or probability associated with scientific findings.	JBS_K1_U01	report
U2	integrate knowledge from various disciplines, including environmental and life sciences, social sciences, and economics, to develop solutions for complex sustainability challenges.	JBS_K1_U01	report
U3	effectively communicate scientific concepts and findings related to environmental and life sciences in a clear and concise manner, both verbally and in writing, for various audiences.	JBS_K1_U02	report
<b>Social competences - Student is ready for:</b>			
K1	collaborative work in interdisciplinary teams to address sustainability challenges.	JBS_K1_K01, JBS_K1_K02	presentation
K2	respectful communication and exchange of ideas in a diverse learning environment.	JBS_K1_K02	presentation
K3	critical reflection on the ethical implications of scientific research and its applications in sustainability solutions.	JBS_K1_K03, JBS_K1_K05	presentation

## Calculation of ECTS points

Activity form	Activity hours*
Lecture with elements of a discussion class	36
preparation for the exam	40

preparation of a multimedia presentation	14
report preparation	10
<b>Student workload</b>	<b>Hours</b> 100
	<b>ECTS</b> 4.0

\* hour means 45 minutes

## Study content

No.	Course content	Subject's learning outcomes
1.	Introduction to environmental and life sciences (E&LS).	W1
2.	What is life? The chemical and biological foundations of life.	W1
3.	Ecosystems and environmental sciences. Biodiversity.	W3, U1
4.	The ecosphere: Emergent properties of complex systems.	W2, U1
5.	Global change: Planetary boundaries & resilience.	W3
6.	Scientific thinking & knowledge transfer: From data to policy.	W4
7.	The role of E&LS in sustainability	W4
8.	Case studies (CS) responding to SDGs through ELS - e.g. land degradation, human health, biodiversity.	U2
9.	CS - MICRO LEVEL analysis - MICRO LEVEL analysis - From genes to individuals.	U2, K1, K2, K3
10.	CS - MACRO LEVEL analysis - From populations to land systems.	U2, K1, K2, K3
11.	CS - SOCIO-ECONOMIC LEVEL analysis - Human-nature interactions and environmental policies.	U2, K1, K2, K3
12.	CS - Integrated analysis and discussion.	U2, U3, K1, K2, K3

## Course advanced

### Teaching methods :

project method, conversation lecture, case study, practicals

Activities	Examination methods	Credit conditions
Lecture with elements of a discussion class	written exam, report, presentation	written exam (40%); collaborative project report (40%); student presentations (20%); active participation

## Entry requirements

None

## Literature

### Obligatory

1. Brinkmann, R. (2016). Introduction to sustainability. John Wiley & Sons.
2. Carson, R. L. (2002). Silent spring. Penguin.
3. Mayr, E. 1998. This is Biology. Harvard University Press.
4. Meadows et al. (1972). The Limits to growth; a report for the Club of Rome's project on the predicament of mankind. New York: Universe Books.
5. Mulligan, M., 2018. An introduction to sustainability. Environmental, social and personal perspectives. 2nd edition. Routledge London and New York.
6. Smithson, P., Addison, K. & Atkinson, K. (2008). Fundamentals of the physical environment. Routledge, London/New York.
7. Zehnder, C., Manoylov, K., Mutiti, S., Mutiti, C., VandeVoort, A., & Bennett, D. (2018). Introduction to environmental science.

## 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_K05	The graduate can defend the importance of scientific data and methods as a basis for decision-making.
JBS_K1_U01	The graduate can critically analyse academic literature, formulate research questions and conduct research under supervision.
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_W01	The graduate can describe the concept of sustainability and recognize the differences in relevant definitions, models and approaches.
JBS_K1_W02	The graduate can explain the axiological background of sustainability and summarize key stages of development of the concept.
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.