

25211 - Ecology I

Syllabus Information

Academic Year: 2022/23

Subject: 25211 - Ecology I

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 571 - Degree in Environmental Sciences

ECTS: 6.0

Year: 2

Semester: First Four-month period

Subject Type: Compulsory

Module:

1. General information

1.1. Aims of the course

The subject and its expected results respond to the following approaches and objectives:

With this subject it is intended that students know the abiotic and biotic factors and the interactions that explain the abundance and distribution of organisms and the functioning of the following levels of organization of life: populations, communities, ecosystems, landscape-territory and biosphere .

This will allow them to: a) address the resolution of environmental problems taking as a reference the functioning of natural systems; b) become aware of Global Change and the bases that Ecology provides to mitigate it; c) face scientific problems in the field of ecology through the rigorous application of the scientific method.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>) and certain specific goals, contributing to a certain extent to their achievement:

- Goal 4: Ensure inclusive, equitable and quality education and promote lifelong learning opportunities for all

- o Target 4.7 By 2030, ensure that all students acquire the theoretical and practical knowledge necessary to promote sustainable development, including through education for sustainable development and sustainable lifestyles, human rights, equality of gender, the promotion of a culture of peace and non-violence, world citizenship and the appreciation of cultural diversity and the contribution of culture to sustainable development.

- Goal 14: Conserve and sustainably use the oceans, seas and marine resources

- o Goal 14.1; 14.2 and 14.3. Related to the prevention, management and minimization of ocean degradation and pollution.

- Goal 15: Manage forests sustainably, combat desertification, halt and reverse land degradation, halt the loss of biodiversity

- o Target 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and the services they provide, in particular forests, wetlands, mountains and arid areas, in consistent with obligations under international agreements.

1.2. Context and importance of this course in the degree

It has been said that ecology is to the environment as physics is to engineering. This subject occupies a central place in environmental sciences and is linked to numerous subjects, some that provide basic knowledge and others that provide conceptual support. Specifically, it plays a fundamental role in module 1 of the "Interpretation of the Natural Environment as a System" curriculum.

On the other hand, it is advisable not to confuse ecology with environment. Ecology is a scientific discipline that aims to know the abundance and distribution of organisms and their interactions with each other and with the environment. Environment is a scientific-technical discipline that aims to solve environmental problems in the natural environment most directly transformed by human beings.

1.3. Recommendations to take this course

This subject is offered in the [English Friendly](#) form.

For the best follow-up of the subject, it is advisable to have passed the subjects of Botany and Zoology, Biology, Fundamentals of Geology and Edaphology, as well as those related to basic sciences. On the other hand, it is convenient:

- Possess basic knowledge of English to understand scientific-technical texts.
- Possess knowledge of computer science at the user level and specifically of the Moodle teaching platform.
- Have the capacity and equipment for field work.

2. Learning goals

2.1. Competences

By passing the subject, the student will be more competent to ...

Understand knowledge in the area of ??environmental sciences that starts from the base of general sec

Apply their knowledge to their work or vocation in a professional way and possess the competencies tha

Gather and interpret relevant data (usually within the environmental sciences) to make judgments that in

Transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.

Undertake further studies with a high degree of autonomy.

Interpret the environment as a complex system: identification of the factors, processes and interactions t

Analyze in a multidisciplinary way the indicators and evidence of an environmental problem or situation,

Value the resources and constituents of the environment in economic, social, legal and ecological terms

Prepare a diagnosis of the environmental situation in a given natural, rural or urban context, based on th

Prospectively establish a scenario of future evolution of the current situation diagnosed and propose the

Prepare and present the reports corresponding to the diagnosis made.

Understand and master the fundamental knowledge of the study area and apply it to the specific tasks o

Solve the problems, generic or characteristic of the area through the interpretation and analysis of the re

Apply theoretical knowledge to the analysis of situations.

2.2. Learning goals

The student, to pass this subject, must demonstrate the following results ...

Evaluate and interpret the role of abiotic factors in the structure and functioning of ecological systems at

Differentiate and apply the different growth models of biological populations.

Recognize in the field the cycle of organic matter in terrestrial ecosystems.

Identify the main environmental services of ecosystems (SDG 14 and 15).

Incorporate and manage the contingent view of nature in your analysis of ecological processes.

Identify and critically assess the main syndromes of Global Change. (SDG 14 and 15).

Analyze ecological information critically.

Identify and develop maps of environmental units.

Perform information searches, selection of documentation in databases and academic search engines re

Communicate ideas and concepts of Ecology correctly orally and in writing (SDG 4).

Acquire the capacity for autonomous learning and teamwork, in a responsible and committed way, distri

2.3. Importance of learning goals

The learning results obtained will allow addressing the resolution of environmental problems taking as a

the functioning of natural systems and knowing the framework of Global Change. This will be especially

application of environmental methodologies such as impact assessments, environmental planning and r

projects.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

3.1. Type of tests and their value on the final grade and evaluation criteria for each test

The student must demonstrate that they have achieved the expected learning outcomes through the following activities. This subject offers the possibility of continuous assessment, for which it is required to attend at least 80% of the course.

- Two face-to-face written tests on the theory part of the subject program that will be averaged (50% of the grade).
- Preparation of a report of all the practices (25%) and oral exam of all the practices (25% of the grade).

To pass the course through continuous assessment, it will be necessary to have passed, at least, the theoretical tests. Complementary activities may be carried out to improve the overall rating. In any case, all students have the right to request a global evaluation test. The global evaluation test will consist of the following activities:

- Preparation of a general report of all the practices (25%) that will include the following sections: introduction, development and conclusion.
- Written and face-to-face test at the end of the course according to the EPS exam calendar (75% of the grade).

The evaluation criteria for both types of evaluation are the following:

- Correct and fluent expression of ecological concepts
- The ability to relate the concepts acquired in practice and theory.
- Interpretation in the field of ecological processes.
- The ability to integrate and synthesize ecological information.

SDG 4 will be comprehensively assessed in all tests of the subject. SDGs 14 and 15 will be assessed in the practical activities.

The success rate in the subject in the last three years has been 97.14% (academic year 18-19); 96.77% (academic year 19-20); 96.77% (academic year 20-21).

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process that has been designed for this subject is based on the following:

Theoretical sessions: The student will have bibliographic material and the presentations of each topic by the teacher. The teacher will make a masterly presentation of each topic with questions to the students. On the other hand, the evaluation of the theoretical contents will be completed with two written tests (continuous evaluation). **Practical activities:** The practical activities, on the one hand, will consist of full-day field trips for the recognition of ecosystems and the study of their components.

4.2. Learning tasks

The program offered to the student to help him achieve the expected results comprises the following activities:

Theoretical sessions in the classroom:

A presentation is provided for each topic, as well as additional bibliographic material, available on the Moodle platform. The sessions will include interventions by the students and a keynote presentation by the teacher. Other activities include the resolution of exercises and the analysis of case studies. In the block devoted to abiotic factors, a session will be devoted to analyzing their limiting effect on terrestrial ecosystems.

Field trips: These are one-day outings (8-9 hours) in which a working material with scripts is provided to be completed. Field tutorials are also carried out, which consist of individualized outings with the practical work groups. During the outings, the theoretical concepts will be reviewed and the functioning of the terrestrial and aquatic ecosystems will be analyzed.

Laboratory and computer practices: A practice script is provided with the face-to-face and non-face-to-face activities to be carried out.

Tutorials:

For the follow-up of the theory and practical activities, personalized and / or group tutoring sessions are provided. **Teaching jobs:**

Different topics of ecology and environment are proposed that the students develop under the tutoring of the teachers.

In relation to the SDGs, all the learning activities of the subject allow the achievement of the learning out

4.3. Syllabus

This course will address the following topics:

- **Unit 1. Introduction to Ecology**
 - 1 The concept of Ecology. Study object. History
 - 2 Non-equilibrium perspective. Social context
 - 3 The scientific method. System theory. Ecosystem concept. Gaia
 - 4 Ecology and Environment
- **Unit 2. Physical Environment and Organisms**
 - 1 Resource and conditions. Limiting factors
 - 2 Astronomic and geologic context
 - 3 Atmosphere ? Oceanic circulation system
 - 4 Climates and microclimates
 - 5 Organisms and radiation
 - 6 Organisms and Temperature
 - 7 Organism and water availability. Ecohidrology
 - 8 Abiotic factors in water and terrestrial environments
 - 9 Terrestrial environments: geomorphology and soil
 - 10 A synthesis on the importance of abiotic factors. Ecology niche concept
 - 11 Time evolution response
 - 12 History biogeography
- **Unit 3. Populations**
 - 1 Population and metapopulation. Conceptual basis
 - 2 Primary and secondary parameters. Tabulation
 - 3 Life cycles
 - 4 Intraspecific competition
 - 5 Population dynamics
 - 6 Growth regulation

4.4. Course planning and calendar

Calendar of face-to-face sessions and presentation of work

It is estimated that the average student of this subject, of 6 ECTS, has to dedicate 150 hours.

The calendar of the classes will be adjusted to the teaching calendar of the University of Zaragoza. The schedule of the subject and classroom can be consulted on the website of the Higher Polytechnic School of Huesca, as well as the schedule of tutorials and the exam calendar.

All the information of the subject will be presented on the first day of class of each course.

Attendance and participation in face-to-face theoretical classes constitute the common thread of the subject. On the other hand, field trips form the backbone of practical activity, which is developed from them. Regular consultation of the Moodle platform is also essential for monitoring the subject. The calendar in which the activities are registered is published in this guide in the schedule in the last section.

Tipo actividad / Semana	1	2	3	4	5	6	7	
	15-16 sep	19-23 sep (1)	26-30 sep ⁽²⁾	3-7 oct ⁽³⁾	10-14 oct	17-21 oct	24-28 oct	3'
					Festivo 12 oct (mié)			F oc

<i>Actividad Presencial</i>							
Teoría	2	2	2	2	2	2	2
Problemas					2		2
Prácticas laboratorio							
Trabajos en grupo							
Salidas de prácticas				7		6	
Tutorías ECTS							
Evaluación							
<i>Actividad No presencial</i>							
Trabajo individual	6	6	4	6	4	4	4
Trabajo en grupo						2	2
TOTAL	8	8	6	15	8	14	10

 prac lab	(1) El viernes 23 de septiembre se seguirá
 vacaciones	(2) El viernes 30 de septiembre se seguirá
 periodo exámenes	(3) El viernes 7 de octubre se seguirá hora

Periodo de clases

Del 15 de septiembre de 2022 al 22 de diciembre

Periodo de evaluación

Del 11 al 27 de enero de 2023

4.5. Bibliography and recommended resources

- BB** Begon, Michael. Ecología : individuos, poblaciones y comunidades / Michel Begon, John L. Harper, Colin R. Townsend ; traducido por Miquel Riba Rovira, Raymond Salvador Civil. 3ª ed. Barcelona : Omega, D.L. 1999
- BB** Smith, Thomas Michael. Ecología / Thomas M. Smith, Robert Leo Smith. 6a. ed. Madrid [etc.] : Pearson Addison-Wesley, D.L. 2007
- BC** Díaz Pineda, Francisco. Ecología I : ambiente físico y organismos vivos / Francisco Díaz Pineda. 2ª reimp. Madrid : Síntesis, 1989 (reimp. 1996)
- BC** Margalef, Ramón. Planeta azul, planeta verde / Ramón Margalef. [1a. ed.] Barcelona : Prensa Científica, 1992

BC Rodríguez, Jaime. Ecología / Jaime Rodríguez. Madrid : Pirámide, D.L. 1999

BC Terradas, Jaume. Ecología de la vegetación : de la ecofisiología de las plantas a la dinámica de comunidades y paisajes / Jaume Terradas. Barcelona : Omega, D.L. 2001

The updated recommended bibliography can be consulted in:<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=25211>