

Academic Year/course: 2022/23

25215 - Ecology II

Syllabus Information

Academic Year: 2022/23

Subject: 25215 - Ecology II

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 571 - Degree in Environmental Sciences

ECTS: 6.0

Year: 2

Semester: Second Four-month period

Subject Type: Compulsory

Module:

1. General information

1.1. Aims of the course

The aim of this subject is to learn about the abiotic and biotic factors and interactions that explain the abundance and distribution of organisms and the functioning of the following levels of organisation of life: communities, ecosystems, landscape-territory and biosphere.

This will enable them to:

- a) approach the resolution of environmental problems with the functioning of natural systems as a reference;
- b) become aware of Global Change and the bases provided by Ecology to mitigate it;
- c) tackle 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 targets, contributing to some 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 learners acquire the knowledge and skills necessary to promote sustainable development, including through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and 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 Target 14.1; 14.2 and 14.3. Related to the prevention, management and minimisation of ocean degradation and pollution.
- Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss
 - 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 drylands, 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 the environmental sciences and is linked to numerous subjects, some of which provide basic knowledge and others to which it gives conceptual support. In particular, it plays a fundamental role in module 1 of the "Interpretation of the Natural Environment as a System" syllabus.

On the other hand, it is important not to confuse ecology with environment. Ecology is a scientific discipline that aims to understand 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 humans.

1.3. Recommendations to take this course

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

2. Learning goals

2.2. Learning goals

- Analyse the influence of biological interactions on ecological complexity.
- Understand the meaning and apply methods for estimating biological diversity.
- Interpret communities and ecosystems over time, incorporating the concept of disturbances (SDG 14 and 15).
- Know the meaning and apply methods for estimating biological production.
- Use the concept of "ecosystem services" in their valuation of ecosystems (SDGs 14 and 15).
- Incorporate and manage the contingent view of nature in their analysis of ecological processes.
- Identify and critically assess the main syndromes of Global Change (SDG 14 and 15).
- Critically analyse ecological information.
- Carry out information searches, selection of documentation in databases and academic search engines related to ecology.
- 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 manner, distributing tasks and sharing responsibilities.

3. Assessment (1st and 2nd call)

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

In relation to the SDGs, their assessment is carried out in all the activities of the subject.

The success rate in the subject in the last three years is 93.9% (academic year 18-19), 100% (academic year 19-20) and 96.5% (academic year 20-21).

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions, fieldwork and tutorials.

The practical part will consist in: (i) a full day field work devoted to ecosystem recognition and (ii) the elaboration of several ecology reports of a field area near Huesca city. These reports will be supervised by the teacher. They will consist in regular team tutorials. Both practical activities will be completed with: (i) computer sessions in order to learn to manage ecologic models, and (ii) lab sessions dedicated to perform different analysis and experiments.

In relation to the SDGs, all the learning activities of the subject enable the learning outcomes related to the SDGs to be achieved.

4.2. Learning tasks

This 6 ECTS (150 hours) course is organized as follows:

- **Lectures.** A presentation of each lesson will be provided, as well as additional references, both available on Moodle platform which will have to be studied before every lecture. These sessions will comprise student's involvement and master presentation by the teacher. Other sessions will correspond to expert's participation in the subject and seminars presented by students. External experts will give specific conferences. In the ecosystems block, one session will be devoted to the recognition of the main disturbances affecting the terrestrial, aquatic and marine ecosystem (SDGs 14 and 15).
- **Laboratory and computer practice sessions.**
- **Fieldwork.** One day activities (8-9 hours) in which working material is provided, with a script to be completed through students' direct observations in the field. A script will be provided with on-site and non-on-site activities. The field trips will review theoretical concepts and observe the functioning of terrestrial and aquatic ecosystems, as well as existing or potential disturbances in each of them (SDG 15).
- **Tutorials.** To follow up theory and practice lessons personal and team tutorials will be provided.
- **Academic assignment.** Different topics on Ecology and Environment will be offered to the students which should elaborate a report supervised by the teacher.
- **Assessment.** The evaluation of the theory will be completed with two tests. (Continuous Evaluation).

4.3. Syllabus

This course will address the following topics:

Lectures

- Unit 1. Ecosystems
 - 1. Energy and matter in the ecosystems
 - 2. Biological production
 - 3. Nutrient cycles
 - 4. Trophic nets
- Unit 2. Interactions
 - 1. Intraspecific competition
 - 2. Interactions
 - 3. Interspecific competition
 - 4. Exploitation: Herbivory, predation, parasitism
- Unit 3. Communities
 - 1. Type of communities and their structure
 - 2. Biological diversity
 - 3. Succession and perturbations
- Unit 3. Landscape and Biosphere
 - 1. Relations between humans and nature
 - 2. Global Change
 - 3. Contribution of Ecology to Sustainable Development

4.4. Course planning and calendar

The indicative timetable of the different learning activities developed in the course is shown below:

Type of activity / Week	1	2 (1)	3 (2)	4 (3)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Total	
Face-to-face activity																				62	
Theory	2	2	2	2	2	2	1	2	2		2	2	2	2	1						26
Problems																					0
Practical laboratory work			2		2	2			2				2								10
Group work																					0
Practical field trips				7				7				6									20
ECTS tutorials																					0
Evaluation							1	1							1		3				6
Non-attendance activity																				90	
Individual work	3	4	4	1	3	3	3	4	4	7	2	2	3	6	6	7	8				70
Group work					3	3	3				3		3	2	2	1					20
TOTAL	5	6	8	10	10	10	8	14	8	7	7	10	10	10	10	8	11	0	0	152	

(1) Friday 10 February will follow Monday timetable

(2) Friday 17 February will follow Monday timetable

(3) Friday 24 February will follow Monday timetable

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Sciences website and Moodle.

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** 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=25215>