

**Ecology**

Code: 100854  
ECTS Credits: 6

| Degree                        | Type | Year | Semester |
|-------------------------------|------|------|----------|
| 2500251 Environmental Biology | FB   | 1    | 2        |

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

**Teachers**

Bernat Claramunt Lopez

**External teachers**

Rafael Poyatos López

**Prerequisites**

Although there are no official prerequisites, it is advisable that the student has completed the elective subjects of Biology and Earth Sciences and the Environment of the Bachelor of Science

**Objectives and Contextualisation**

The ecology in the degree:

It is a first-year course that introduces students to the most basic concepts and methods of ecology. It emphasizes the relationships of organisms with the physical environment, the structure and dynamics of populations and communities, and the transfer of matter and energy within communities. The methodological aspects are treated in a shallow way since they are the object of the Natural Environment Prospection subject, which the students will attend simultaneously.

In subsequent courses, the student will complete this knowledge with a more global vision of ecology in the subject of Biosphere Sciences. They will also receive knowledge related to ecology, its methods and applications in subjects such as Conservation Biology, Environmental Cartography Analysis, Microbial Ecology, Assessment of Species and Ecosystems, and Vegetation Analysis, third year; and the elective course Forest Ecology, fourth year.

The main objective of the subject is to provide basic training for the study of the structure and functioning of natural systems at three basic levels of organization:

**Populations:** training the student in the concept of population and its meanings and introducing it in the techniques of sampling the abundance of organisms, and monitoring and modelling the dynamics of populations.

**Communities:** teaching the student to evaluate the structure of the communities, the functional relationships between species (interspecific competition, depredation, symbiosis) and their manifestations at community level (trophic networks); analyse its dynamics in time (succession and disturbances) from the different points of view of historical and current ecology.

**Ecosystems:** introducing the student in the exchanges of matter and energy in trophic networks, as a preliminary step to the study of the biogeochemical cycles that will be carried out in the subject of Biosphere Sciences.

## **Competences**

- Adopt an ethical stance.
- Communicate efficiently, orally and in writing.
- Describe, analyse and interpret the vital adaptations and strategies of the principal groups of living beings.
- Develop strategies of analysis, synthesis and communication in order to teach biology and environmental studies.
- Manage, conserve and restore populations and ecosystems.
- Obtain information, design experiments and interpret results.
- Reason critically.

## **Learning Outcomes**

1. Adopt an ethical stance.
2. Apply demographic models of population growth and interaction between species.
3. Communicate efficiently, orally and in writing.
4. Interpret the mechanisms that determine the complexity, stability and dynamics of ecosystems.
5. Obtain information, design experiments and interpret results.
6. Reason critically.
7. Recognise the basic principles of animal biology that must be conveyed in the field of secondary education.
8. Recognise the characteristics of the environment that determine the distribution of organisms.
9. Recognise the processes that determine energy and matter balances in ecosystems.

## **Content**

### **Part I. Organisms and populations**

1. Introduction to Ecology
2. Ecology and evolution
3. Response of organisms to environmental factors
4. Populations: basic concepts
5. Parameters and demographic processes. Basic population models
6. Demography of structured populations

### **Part II. Communities and ecosystems**

7. Organisation of communities - Diversity and richness

8. Interactions between species
9. Interchange of matter and energy
10. Trophic networks
11. Global change

\*Unless the requirements enforced by the health authorities demand a prioritization or reduction of these contents.

## Methodology

The teaching methodology aims to achieve student training objectives that include both the acquisition of knowledge and training to continue studying (the so-called academic and professional skills). Various teaching-learning strategies will be combined so that the student has a particularly active role during the entire training process:

- 1) Master classes. The lectures or lectures represent the main activity to be done in the classroom and allow to transmit basic concepts to a large number of students in a relatively short time. They will be complemented with Power Point presentations and diverse didactic material that will be delivered to the students at the beginning of the course.
- 2) Classroom practices. They are work sessions by groups with a small number of students, based on questions or exercises delivered for their realization in class. They are proposed as a complement to the lectures and will be used preferably to develop the most numerical aspects of ecology, or to discuss practical cases.
- 3) Practice sessions. The practices allow to approach the complexity of the concepts, patterns and processes that characterize living systems through autonomous and group learning methodologies. Far from being simply an illustration of theoretical concepts, the model of practical classes aims to be self-explanatory and cover various aspects of a specific topic in two sessions held in small groups. In each one of them a field session will be carried out in which the student will get in touch with a case study and state the objectives and sampling methodology. This session will be combined with a session in the computer room dedicated to the treatment of the collected data and its discussion.
- 4) Delivery of works. The course incorporates a Moodle platform and virtual evaluation systems that students will use for the delivery of various papers and to answer questions during the course, which will allow them to become familiar with the e-learning platforms that will be very frequent in the university and the society of the future. The work delivered may be subject to group correction in the tutorials, which will also serve to resolve the particular doubts of the students. Eventually, the Moodle platform will also offer students forums and other internal communication tools such as chats because, either among themselves and / or with the teacher, they can discuss certain aspects of the subject they want to share or discuss with other classmates. class.
- 5) Tutorials. The aim of the tutorials is to solve doubts, review basic concepts not explained in class, and provide guidance on the sources consulted by students. They will be done at the individual level in the teachers' office, at agreed times. Eventually, collective tutoring can be scheduled in the classroom, after agreement with the class delegates.

\*The proposed teaching methodology may experience some modifications depending on the restrictions to face-to-face activities enforced by health authorities.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

| Title | Hours | ECTS | Learning Outcomes |
|-------|-------|------|-------------------|
|-------|-------|------|-------------------|

Type: Directed

|                                                             |    |      |                     |
|-------------------------------------------------------------|----|------|---------------------|
| Classroom practices                                         | 5  | 0.2  | 2, 4, 9, 8          |
| Computer practices                                          | 8  | 0.32 | 2, 3, 4, 6, 9, 8    |
| Field practices                                             | 14 | 0.56 | 2, 3, 4, 6, 7, 9, 8 |
| Master classes                                              | 27 | 1.08 | 4, 6, 7, 9, 8       |
| Type: Supervised                                            |    |      |                     |
| Deliveries                                                  | 2  | 0.08 | 2, 4, 9, 8          |
| Tutorials                                                   | 16 | 0.64 | 2, 3, 4, 6, 9, 8    |
| Type: Autonomous                                            |    |      |                     |
| Realization of a poster of practices                        | 16 | 0.64 | 2, 3, 4, 6, 7, 9, 8 |
| Realization of problems and exercises (classroom practices) | 10 | 0.4  | 2, 3, 4, 6, 9, 8    |
| Study                                                       | 45 | 1.8  | 2, 4, 6, 9, 8       |

## Assessment

### Evaluation

The evaluation will be made based on the following activities:

The exams (50% of the qualification). There will be two partial exams in which there may be three types of questions:

Short answer questions aimed at assessing whether the key conceptual objectives have been reached, although in some cases there may be some more aimed at objective attitudinal or methodological values.

Problems or exercises with numerical calculation, designed to evaluate the achievement of methodological objectives.

Questions that involve a complex answer with the development of a topic or the presentation of a hypothesis. The space to respond is limited to one page per question. We want to assess if the student is able to explain and relate complex processes or concepts.

The presentation of a poster of the practices (30% of the qualification). The practices of the subject of Ecology are obligatory and consist of field and computer sessions. They will be evaluated by groups through a formative methodology, which will allow the student an additional learning. Students must present a poster in groups of 4-5 people, which will be subject to an evaluation that will include (1) an initial correction of the posters presented, (2) a tutorial with the working group to identify the main errors of the work and discuss the eventual improvement, and (3) the presentation and correction of a final version of the work. The first version counts 50% of the work qualification, and the final correction contributes the remaining qualification. One third of this qualification will come from the evaluation of the rest of the groups, which will be done in a specific session, and the remaining two thirds of the teacher's evaluation. The contents worked on in the second practice will be evaluated in the exam.

The delivery of exercises and questions in the classroom (20% of the qualification). There will be between 5 and 10 deliveries throughout the course.

### Recovery

At the end of the course there will be a recovery exam. According to current regulations of the UAB, to participate in the recovery, the student must have been previously evaluated in a set of activities whose weight equals a minimum of two thirds (67%) of the total qualification of the subject.

The exams have a special weight in the evaluation since it is the only individual assessment activity controlled by the teacher. Therefore it is considered that the student must take a qualification higher than 3.5 in each of the partial exams to make average with the other learning activities and pass the subject without going to the recovery exam. It is understood that if the student is submitted to the recovery exam, he/she resigns to the notes of the partial exams.

Definition of "Approved": A student with an average qualification equal to or greater than 5 will be considered approved.

Definition of "Not Evaluable": The student will obtain the "Not Evaluable" qualification when the evaluation activities carried out have a weight lower than 67% in the final qualification. On the other hand, attendance at practical sessions is considered mandatory. Consequently, the student will also obtain the "Not Evaluable" qualification when the unjustified absence is greater than 20% of the scheduled sessions.

\*Student's assessment may experience some modifications depending on the restrictions to face-to-face activities enforced by health authorities.

## Assessment Activities

| Title                                | Weighting | Hours | ECTS | Learning Outcomes         |
|--------------------------------------|-----------|-------|------|---------------------------|
| Delivery of exercises                | 20%       | 1     | 0.04 | 2, 3, 4, 6, 9, 8          |
| Exams                                | 50%       | 4     | 0.16 | 2, 3, 4, 6, 7, 9, 8       |
| Presentation of a poster (practises) | 30%       | 2     | 0.08 | 2, 1, 3, 4, 5, 6, 7, 9, 8 |

## Bibliography

### Books

Begon M, Harper JL, Townsend CR (1999) *Ecología*. Omega, Barcelona.

Begon M., Townsed C.R., Harper J.L. (2006) *Ecology. From Individuals to Ecosystems* (4<sup>a</sup> ed.). Blackwell Publishing, Oxford

Gotelli N. J. (2001) *A primer of Ecology*. (3<sup>o</sup> ed.). Sinauer Associates Inc.,Sunderland, Massachussets.

Krebs C. J. (2009) *Ecology*: (6<sup>a</sup> ed.). Harlow : Pearson Education.

Margalef (1.86) *Ecología* (2<sup>a</sup> ed), Omega, Barcelona

Molles M.C. (2006) *Ecología: conceptos y aplicaciones*. McGraw-Hill, Madri

Odum E.P., Warret G.W. (2006) *Fundamentos de Ecología* (5<sup>a</sup> ed.). Internacional Thompson Editores, México.

Pianka E.R. (2000) *Evolutionary Ecology*. 6th. ed. Addison Wesley Longman, San Francisco.

Piñol & Martínez-Vilalta (2006) *Ecología con números*. Lynx, Bellaterra, Barcelona.

Ricklefs R.E., Miller G.L. (2000) *Ecology* (4<sup>a</sup> ed.). W.H. Freeman & Co., New York.

Townsend C.R., Harper J.L., Begon M. (2003) *Essentials of Ecology* (2<sup>a</sup> Ed.). Blackwell Science, Oxford

Web pages

<http://www.ecologiaconnumeros.uab.es/>

## **Software**

R program