

Course guide

390246 - ECO - Ecology

Last modified: 06/06/2023

Unit in charge: Barcelona School of Agri-Food and Biosystems Engineering
Teaching unit: 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

Degree: BACHELOR'S DEGREE IN LANDSCAPE ARCHITECTURE (Syllabus 2019). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: Jordi Izquierdo Figarola

Others:

PRIOR SKILLS

None

TEACHING METHODOLOGY

Lectures explaining theoretical concepts and fundamentals of the topics of the course will be delivered through Powerpoint presentations, videos and the help of the whiteboard. The content will be available in pdf format. Depending on the health situation of the country, some or all content will be delivered online via Google Meet.

Lectures will be complemented by laboratory internships and activities via Moodle that will be explained in the due moment. Depending on the circumstances, some workshops will be delivered outside the school premises. Workshops will be held in pairs.

LEARNING OBJECTIVES OF THE SUBJECT

The student will be able to:

- Define what ecology is and what environmentalists do.
- Understand what makes an environment habitable for particular species, identifying conditions and resources and how these factors may influence the presence of a species in a particular place.
- Identify and understand the patterns and processes that govern the different structure levels of the landscapes: organisms, populations, communities and ecosystems.
- Identify and understand the relationships of each of the above levels with the environment.
- Understand the functioning of the ecosystem and its organization in space and time.

STUDY LOAD

Type	Hours	Percentage
Hours small group	20,0	13.33
Hours large group	40,0	26.67
Self study	90,0	60.00

Total learning time: 150 h



CONTENTS

Introduction to the Ecology

Description:

1. What is ecology?
2. Object of study of ecology: the scale factor.
3. What is an ecosystem?
4. Disciplines of ecology.
5. The ecology of the landscape.
6. Ecology and ecologism.

Specific objectives:

The student will be able to:

1. Describe what is meant by ecology and what this science studies.
2. Describe what an ecosystem is and what its components are.
3. Explain what the disciplines of ecology are.
4. Define what the ecology of the landscape is.
5. Differentiate between ecology and environmentalism.

Related activities:

Activity 1: Lectures.

Activity 2: Summative assessment.

Activity 3: Activities in Moodle.

Activity 4: Targeted activity.

Full-or-part-time: 12h 30m

Theory classes: 3h

Guided activities: 2h

Self study : 7h 30m

The individuals

Description:

1. Definition and types of organisms.
2. Spatial distribution of organisms.
3. Conditions and resources.
4. Adaptations of organisms to the environment.
5. The ecological niche.

Specific objectives:

In this chapter the student will be able to:

1. Define individual and the different types of individuals found in nature.
2. Understand the nature of, and contrasts between, conditions and resources.
3. Understand how organisms respond to the whole range of a condition but also to "extrem" conditions and to the timing of both variations and extremes.
4. Appreciate how a plant's response to, and its consumption of, the resources of the environment are intertwined.
5. Identify adaptations to the environment that an organism may have developed.
6. Appreciate how responses to conditions and resources interact to determine ecological niches.

Related activities:

Activity 1: Lectures.

Activity 2: Summative assessment.

Activity 3: Activities in Moodle.

Activity 5: Workshops.

Full-or-part-time: 32h

Theory classes: 12h

Laboratory classes: 4h

Self study : 16h

Population

Description:

1. Concept. Population growth. Life tables.
2. Spatial distribution of populations.
3. Estimation of population density.
4. Dispersion indexes.
5. Inter-specific population regulation.

Specific objectives:

The student will be able to appreciate the difficulties of counting individuals, but the necessity of doing so for understanding the distribution and abundance of organisms and populations.

Related activities:

Activity 1: Lectures.

Activity 2: Summative assessment.

Activity 3: Activities in Moodle.

Activity 4. Targeted activity.

Full-or-part-time: 42h

Theory classes: 12h

Guided activities: 8h

Self study : 22h

Species interactions

Description:

1. Factors that influence the dynamics of a population.
2. Inter-specific competition and allelopathy.
3. Predation.
4. Parasitism.
5. Mutualism.
6. Other relationships.
7. The dispersion of populations.

Specific objectives:

Understand the role and the impact of the different relationships that species establish among them in the modulation of the dynamics of the populations.

Related activities:

- Activity 1: Lectures.
Activity 2: Summative assessment.
Activity 3: Activities in Moodle.
Activity 4: Targeted activities.

Full-or-part-time: 20h

Theory classes: 6h
Guided activities: 2h
Self study : 12h

Communities

Description:

1. Definition.
2. Community structure: the biodiversity.
3. Community dynamics: successions.
4. Biodiversity conservation.

Specific objectives:

The student will be able to:

1. Understand what we call community.
2. Understand what the structure of a community is and what factors may act.
3. Describe and understand changes in a community and the factors that cause them.

Related activities:

- Activity 1: Lectures.
Activity 2: Summative assessment.
Activity 3: Activities in Moodle.
Activity 4: Targeted activities.

Full-or-part-time: 31h

Theory classes: 8h
Guided activities: 4h
Self study : 19h

Ecosystems

Description:

1. Ecosystem concept.
2. Metapopulation.
3. The flux of energy and matter.
4. Landscape ecology.

Specific objectives:

1. Identify the different elements that make up an ecosystem and how they integrate to form a landscape.
2. Recognize that communities are closely related to the abiotic environment by the flux of energy and matter.
3. Appreciate that the transfer of energy between trophic levels is always inefficient.
4. Appreciate that the breakdown of matter involves the appearance of water, CO₂ and nutrients.

Related activities:

- Activity 1: Lectures.
Activity 2: Summative assessment.
Activity 3: Activities in Moodle.

Full-or-part-time: 12h 30m

Theory classes: 5h

Self study : 7h 30m

GRADING SYSTEM

Final mark (NF) will be:

$$NF = 0,60 * \text{theory} + 0,40 * (\text{workshops} + \text{targeted activities})$$

Workshops and targeted activities will be delivered continuously throughout the course. Students have to respect the due dates for the assignments.

The final exam will be a face-to-face written test of the entire course, in which the student will get a mark according to his/her level of learning achieved during the course.

In the scenario of a completely online course, continuous evaluation will be carried out synchronously and asynchronously, by the means that were established by the University and the School, with a periodic record of academic activity through deliveries, forums, questionnaires or any other means provided by the Atenea platform, or alternative tools provided to the academic staff. In situations where the online teaching would occur due to extra-academic factors when the face-to-face teaching was already initiated, alterations in the weights or regular control systems of the teaching will be communicated in detail to all students by Atenea.

Completely telematic realization of the course.

If circumstances require so, the course can be taught entirely online including internships as far as possible. In these cases, if the online assessment of the student is not positive, a second evaluation may be carried out consisting on a final overall online test that will be established according to the criteria of the faculty staff and using the TIC means and tools provided by the University or the School to the academic staff.

Online teaching adaptation measures will be applied in accordance with TIC security and personal data protection criteria in order to ensure compliance with Personal Data Protection legislation (GDPR and LOPDGDD)

Completely telematic realization of the course

If circumstances so require, the course can be taught entirely through telematics, including internships and always as much as possible. In these cases, if the continuous telematics assessment is not positive, a second evaluation may be carried out, consisting of a final global test in telematics format that is established according to the criteria of the responsible teachers and the ICT means and tools provided by the University or the Centre.

Non-face-to-face teaching adaptation measures will be applied in accordance with ICT security and personal data protection criteria in order to ensure compliance with Personal Data Protection legislation (GDPR and LOPDGDD)



EXAMINATION RULES.

Assignments must be delivered within the prescribed timeframe.

Group work: the size of the groups must never be larger than that indicated by the teacher and the composition must be notified at the beginning of the activity and cannot be modified.

BIBLIOGRAPHY

Basic:

- Townsend, Colin R; Harper, John L; Begon, Michael. Essentials of ecology. 2nd ed. Oxford [etc.]: Blackwell Publishing, 2003. ISBN 1405103280.
- Smith, T. M; Smith, Robert Leo. Ecología. 6ª ed. Madrid: Addison Wesley, cop. 2007. ISBN 9788478290840.
- Begon, Michael; Harper, John L; Townsend, Colin R. Ecología : individuos, poblaciones y comunidades. Barcelona: Omega, cop. 1988. ISBN 8428208360.
- Menéndez López, Margarita. Pràctiques d'ecologia II : comunitats naturals. Barcelona: Edicions de la Universitat de Barcelona, DL 2000. ISBN 8483381494.
- Garmendia Salvador, Alfonso; Samo Lumbreras, Antonio J. Prácticas de ecología. Valencia: Editorial de la UPV, DL 2003. ISBN 8497053028.

RESOURCES

Hyperlink:

- Intranet docent ATENEA. Course documentation