

Requirements

It is recommended to have the following three subjects already taken (Methods in Biodiversity and Conservation, Botany and Zoology). All activities in this course are conducted in English, so students are expected to have enough knowledge of this language. In addition, it is very recommendable the successful completion of a Statistics course.

2. COMPETENCIES

General competencies:

1. Capacity for critical analysis of information related to Ecology.
2. Capacity for reading comprehension and synthesis.
3. Development of skills related to finding information, using databases and academic search engines to identify and select documents related to Ecology.
4. Ability to present an argument supported by textbooks and other sources of information provided on the subject.
5. Oral and written communication of ideas and concepts related to Ecology.
6. Consolidation of independent learning skills and the ability to work as part of a team in a responsible and committed manner, distributing tasks and sharing responsibility.

Specific competencies:

1. To understand the main concepts, principles and Theories that conform Ecology.
2. To understand the adaptive strategies of organisms and the factors that determine them.
3. To understand the relationships between organisms, and of these with their environment, and of the processes that determine population, community and ecosystem dynamics.
4. To understand the most relevant ecological patterns and their underlying biological processes.
5. Have an understanding of the methodologies used to answer ecological questions and to understand its practical applications.

3. CONTENTS

Classroom lectures	
SECTION 1. Introduction to ecology and evolutionary ecology	
Topic 0. Introduction (0.5h)	
Topic 1. Conceptual introduction to Ecology (0.5h)	
Topic 2. Evolutionary Ecology (3h)	
	• 4 hours

<p>SECTION 2. Abiotic factors and organismal responses</p> <p>Topic 3. Resources and environmental conditions. Climates, microclimates and the influence of climates, microclimates and topography (2h)</p> <p>Topic 4. Organisms, light and temperature (2h)</p> <p>Topic 5. Organisms and water (2h)</p> <p>Topic 6. Organisms and mineral nutrients (2h)</p> <p>Topic 7. Organisms and perturbations (1h)</p> <p>Topic 8. Physical and -chemical characteristics of aquatic ecosystems (4h)</p>	<ul style="list-style-type: none"> • 13 hours
<p>SECTION 3. Population ecology</p> <p>Topic 9. Properties of populations. Birth, death, dispersal and migration (3h)</p> <p>Topic 10. Population dynamics (3h)</p> <p>Topic 11. Intraspecific competition (2h)</p>	<ul style="list-style-type: none"> • 8 hours
<p>SECTION 4. Organismal Interactions and community ecology</p> <p>Topic 12. Introduction to species interactions. Intraspecific competition (5h)</p> <p>Topic 13. Predation and herbivory (5h)</p> <p>Topic 14. Introduction to the study of communities. Mutualistic networks (3h)</p> <p>Topic 15. Biological diversity and quantification (3h)</p> <p>Topic 16. Ecological succession and perturbations (3h)</p>	<ul style="list-style-type: none"> • 19 hours
<p>SECTION 5. Structure and function of aquatic ecosystems</p> <p>Topic 17. Continental aquatic ecosystems (2 h)</p> <p>Topic 18. Continental-marine aquatic ecosystems (2 h)</p> <p>Topic 19. Marine ecosystems (2 h)</p>	<ul style="list-style-type: none"> • 6 hours
<p>SECTION 6. The flux of energy and matter in ecosystems</p> <p>Topic 20. Introduction to the flux of energy and matter in communities. Primary productivity (2h)</p> <p>Topic 21. Secondary productivity (1h)</p> <p>Topic 22. Flux of energy in communities and biogeochemical cycles (3h)</p>	<ul style="list-style-type: none"> • 6 hours

Seminar sessions	
In the 1 st and 2 nd quarters, 9 h and 8h of seminars will be given, respectively. SEMINAR GROUPS SIZE WILL BE OF 25 STUDENTS.	
1st quarter	
1. Write and present scientific results (3 hours). 2. Literature review of key concepts in Ecology leading to an oral and poster presentation (4 hours) 3. Critical review of a laboratory-based scientific article written by fellow students (1 hour)	<ul style="list-style-type: none"> • 8 hours
2nd quarter	
1. Why to conserve biological diversity? (1 hour) 2. Conduct a scientific review focusing on positive intraspecific interactions, and present it as an oral communication (6 hours) 3. Review of a field-work based scientific article written by fellow students (1 hour)	<ul style="list-style-type: none"> • 8 hours

Lab and field work sessions	
Lab and field work sessions (24 hours) will alternate throughout the course. 1 st quarter: 10 hours (5 lab sessions of 2 hours each) 2 nd quarter: 14 hours (1 field trip of 2 days duration)	
1st quarter	
Lab session 1: Macroecology. Geographic patterns of body size of European mammals	<ul style="list-style-type: none"> • 4 hours (2 sessions)
Lab session 2: Environmental factors that determine the emergency and growth of grasses on pine tree restored populations	<ul style="list-style-type: none"> • 6 hours (3 sessions)
2nd quarter	
Field work: Study of ecological patterns and processes in the field through the design and execution of a scientific research project.	<ul style="list-style-type: none"> • 14 hours

4. TEACHING-LEARNING METHODS. TEACHING ACTIVITIES

4.1. Distribution of credits

Total number of hours: 300 (12 ECTS)	
Number of classroom hours: 96	<ul style="list-style-type: none"> • Lectures on theory: 56 hours • Seminars: 16 hours • Laboratory work / deskwork: 10 hours • Fieldwork: 14 hours
Number of hours of independent study by students: 194	<ul style="list-style-type: none"> • Self-study of theory, seminar and lab subjects: 119 hours • Individual or group preparation of subject topics: 30 hours • Reading of scientific and popular science texts: 15 hours • Preparation of scientific papers, posters and oral presentations: 30 hours
Individual or small group tutorials	<ul style="list-style-type: none"> • 10 hours

4.2. Methodological strategies, materials and educational resources

Classes	<ul style="list-style-type: none"> • Lectures to large groups • Lectures to smaller groups on experimental design and scientific presentations • Study and case study discussions • Oral presentation of scientific information prepared by the students • Carrying out scientific experiments or sampling in the lab, deskwork and fieldwork. • Idea debate, topics derived from popular science and scientific articles. • Critically reading and synthesising scientific articles
Independent / self-study	<ul style="list-style-type: none"> • Self-study of areas which complement the topics covered in class • Reading of scientific and popular science articles • Finding information from the scientific literature to support the position taken in debates. • Writing scientific papers and a scientific poster • Preparing an oral presentation using Power Point • Study of the subject
Individual tutorials	<ul style="list-style-type: none"> • Providing individualised attention to students through tutorials for monitoring adequately their progress

- Providing attention to students in small groups to help them in different activities

5. EVALUATION: Procedure, assessment criteria and marks

Theory, labs and seminars are evaluated separately and weight 40%, 30% and 30% of the final mark, respectively. To pass the subject, the student must pass each of these three parts (i.e. theory, seminars and lab).

EVALUATION PROCEDURES

Two evaluation modes are available, continuous and final. Students are expected to follow the Continuous Evaluation Mode. Exceptions to this require the Dean permission for choosing the Final Examination Mode (see below); permission that must be sought within the first two weeks of the course. Participation in the Continuous Evaluation Mode involves attending a mandatory minimum of 80% of classes (labs and seminars) to pass the course. In this continuous mode, 60% of the final mark will be obtained through a continuous evaluation process.

- Students are deemed ineligible for the Continuous Evaluation Mode when one or more of the following situations arise:
 - They have not attended the established minimum number of classes.
 - They have failed to participate in scheduled activities without good cause.
 - They have failed to deliver work within the prescribed period without good cause.
- Students are entitled to a final examination in the extraordinary examination session in case of failing the continuous evaluation.

EVALUATION CRITERIA

The evaluation is aimed at showing the extent to which the student has participated actively in class, and has the capacity of:

- Showing an understanding of the concepts and main ideas of the subject
- Interrelating the different aspects of the theory.
- Analysing and scientific interpretation of data obtained in the field or the laboratory
- Assimilating and applying subject contents to different situations
- Finding scientific information about the questions posed related to the subject
- Solving problems effectively and comprehensively
- Arguing ideas coherently, both orally and in writing
- Showing the ability for reflection and critical thought

Regarding submitted work and reports, they will be assessed on the basis of:

- Originality and synthesising ability
- Coherent structure and good presentation
- Sound and well dimensioned presentation of quantitative information
- Clarity, quality, spelling and style of writing
- Consultation and contrasting of the specialised literature
- Hand in assignments in due form and timely manner

Also, those students that undertake voluntary work over aspects of the subject can have their effort reflected in the final mark. For a given voluntary submitted work to be evaluated, the students must previously agree with the professor the contents, goals and requirements of the works.

MARKING CRITERIA

The final marks of the subject will correspond to the following numerical marks and scale, to a decimal precision level and a single qualitative mark:

- 0,0 – 4,9 *SUSPENSO (SS)* (FAIL)
- 5,0 – 6,9 *APROBADO (AP)* (PASS)
- 7,0 – 8,9 *NOTABLE (NT)* (GOOD)
- 9,0 – 9,5 *SOBRESALIENTE (SB)* (EXCELLENT)
- 9,5 – 10,0 *MATRÍCULA DE HONOR* limited to 5% (HONORS)

A) CONTINUOUS EVALUATION MODE

The topics taught in **labs and seminars will be the basis for the continuous evaluation mode**. The student must attend a minimum of 80% of in-person classes for the continuous evaluation mode to be applied. Attendance will not be recognised as a merit and hence will not be positively marked. However, unjustified absence from class will penalise the final mark up to 1 point.

The evaluation of each of the parts of the subject and its relative contribution to the final mark is as follows:

1. Laboratory and field work (3 marks out of 10):

Continuous evaluation of **practical classes** will correspond to:

- Short test / short question assignments. This type will be used in those labs where there is no writing of a scientific article.
- The write up of a scientific article of one of the lab sessions of the first quarter.
- The write up of a scientific article of the fieldwork lab of the second quarter.

At the beginning of the course, students will be given information on the Online Campus about the relative weight of points 2 and 3 above on the final mark.

2. Seminars (3 marks out of 10):

Assessment will be based on the critical revision in written form of scientific articles, as well as oral presentations, posters and/or written assessments of Ecology topics selected by the professors. The weight of each oral presentation + poster will be detailed at the beginning of term in the Online Campus.

3. Theory (4 marks out of 10)

To assess this part of the subject the student will take multiple choice and/or short question tests.

The students will take two exams during the course, and the final mark will correspond to their average. However, for the average to be calculated the student will require a minimum mark of 4.0 (over 10) in each exam. In case of failing one exam, the student

has the option of only taking the extraordinary examination of that part in June-July instead of the two.

A student will be considered “No Presentado” when, not having explicitly mentioned to the professors that they opt out of the Continuous Evaluation mode, have not participated in any activity of the teaching-learning process described above.

B) FINAL EXAMINATION MODE

This evaluation mode will be used by those students that do not select the continuous evaluation mode. The final exam will have theoretical and practical exercises: Theory (55%), Labs (30%) and Seminars (15%). The type of exam will preferentially be written, multiple choice tests and/or short essay questions, but could also include oral questions. The areas that can be evaluated by this last procedure will be announced to the students well in advance.

A student will be deemed “Not Presented” to the examination, when having declined continuous evaluation, the student does not attend the final exam in due form and timely manner (date announced).

6. BIBLIOGRAPHY

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