

Applied Ecology

Code: 102801
ECTS Credits: 6

Degree	Type	Year	Semester
2501915 Environmental Sciences	OT	4	0

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

Mariona Ferrandiz Rovira
Bernat Claramunt Lopez

Prerequisites

There are no specific pre-requisites although it is to have passed the Ecology subject.

Objectives and Contextualisation

The general objective of the subject is that students work the main concepts and available methodologies in both Applied Ecology and Conservation Biology for the analysis and project design of research and management. The specific objectives are:

- (1) To get the basic ecological concepts study of biodiversity conservation and its management, from populations to ecosystems.
- (2) To identify what are the main processes that are currently threatening biodiversity in our natural systems.
- (3) To set a scientific framework that enables the analysis of environmental problems to define more sustainable strategies of management.
- (4) To debate on management in the field of Conservation Biology.

Competences

- Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
- Analyze and use information critically.

- Collect, analyze and represent data and observations, both qualitative and quantitative, using secure adequate classroom, field and laboratory techniques
- Demonstrate adequate knowledge and use the most relevant environmental tools and concepts of biology, geology, chemistry, physics and chemical engineering.
- Demonstrate concern for quality and praxis.
- Demonstrate initiative and adapt to new situations and problems.
- Learn and apply in practice the knowledge acquired and to solve problems.
- Quickly apply the knowledge and skills in the various fields involved in environmental issues, providing innovative proposals.
- Teaming developing personal values regarding social skills and teamwork.
- Work autonomously

Learning Outcomes

1. Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
2. Analyze and use information critically.
3. Demonstrate concern for quality and praxis.
4. Demonstrate initiative and adapt to new situations and problems.
5. Describe, analyze and evaluate the environment.
6. Diagnose and solve environmental problems concerning the biological environment.
7. Identify and interpret the diversity of organisms in the environment.
8. Identify organisms and biological processes in the surrounding environment and evaluate them properly and originally.
9. Learn and apply in practice the knowledge acquired and to solve problems.
10. Manage and conserve populations and ecosystems.
11. Observe, recognize, analyze, measure and properly and safely represent organisms and biological processes.
12. Participate in environmental assessments as to the biological environment.
13. Teaming developing personal values regarding social skills and teamwork.
14. Work autonomously

Content

The Subject is organized into two theory modules and several practical sessions as follows:

INTRODUCTORY MODULE

1. Biodiversity and its conservation.
2. Measuring biodiversity.
3. Biodiversity's state.
4. How can we current pressures on biodiversity?

SPECIES CONSERVATION

5. Population dynamics.

NATURAL SYSTEMS CONSERVATION

6. Natural systems: What must we conserve?
7. Tools for of natural systems.

8. Natural protected areas and context.

ECOSYSTEM'S CONSERVATION

9. Ecosystem's conservation.

Practical sessions consist of these activities:

Practice 1. Biological indicators of fluvial system quality - Objective: determination of the water quality in the Tordera basin using indexes based on aquatic macroinvertebrate community composition. This practice consists of a field session (5-6 h) to collect samples of Tordera river, and a laboratory session (4 h) to process samples and calculate indexes (FBILL and BMWPC based on family's diversity of the benthonic macroinvertebrate community).

Practice 2. Tools for management and conservation of species - Objective: To develop population dynamics models. The practice consists of 2 computer sessions in a classroom where we work possible management strategies for a brown bear (*Ursus arctos*) population.

Practice 3. Territory management and planning of actions - Objective: to know on its real context management problems of a protected area. The of a guided visit to a Natural Parc.

Methodology

Directed activities

1) Theoretical lessons aims to give the student the basic contents in the field of sustainable conservation of natural systems and their ecosystem services. In addition (i) students are asked to analyze current scientific work; and (ii) do case studies where students must use the knowledge acquired to solve them.

2) In the practical fieldwork and laboratory sessions, students apply various techniques for the conservation of species and natural systems. There are three different activities:

- Laboratory sessions (determination of biological index of water quality): it consists of a previous visit to the field to collect biological material, its classification and the calculation of the biological index.

- Computer practices (population dynamics): you learn the use of a software that allow you to work, analyze and criticize some of the concepts and methods treated in the theoretical sessions.

- Field trip (protected areas): A guided tour of a Natural Park is carried out to know the day-to-day management and conservation of the Park.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practice sessions of field and lab	20	0.8	
Theory classes	30	1.2	

Type: Supervised

Analysis of scientific works	20	0.8
Resolution of study cases	20	0.8
Type: Autonomous		
Analysis of scientific works	15.5	0.62
Cases of study	30	1.2

Assessment

The evaluation of the subject is distributed as follows:

- a) Individual exams of theory and practices (2 partials of 30%).
- b) Analysis of scientific work and resolution of case studies (40%).

To participate in the recovery students must have previously been evaluated in a set of activities whose weight equals to a minimum of two thirds of the total grade of the subject.

It will be necessary to take an average mark higher than 3.5 as an average mark of the two partial exams in order to compute a global average for subject with all evaluation activities included (exams, analysis of scientific work and resolution of case studies) to pass the subject (that is, a minimum grade of 5). In case the average note of the two partials does not reach 3.5, the note of the partial ones would not be considered and a reassessment examination would be necessary. This re-assessment exam corresponds to 60% of the mark (40% theory and 20% practical). In this reassessment examination the requirement of a 3.5 minimum mark is maintained to consider the remaining notes of the student (cases of study and analysis of scientific work); otherwise the subject would be suspended.

For the rest of assessment activities, you do not need to obtain any minimum mark to make averages.

The non-delivery of any of the assessment activities within the established period implies a zero note for that activity. If you do not see any of the practice sessions, the corresponding block note is zero.

The "Non-Appraising" rating will be applied by substituting the "Not Presented" figure.

Students who can not attend an individual assessment test due to a justified reason (such as illness, death of a first-degree relative or accident) and provide the official documentation to the corresponding professor, will be entitled to take the test in question on another date.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Analysis of scientific works	20	2.5	0.1	2, 4, 1, 14, 13
Case studies	20	5	0.2	2, 3, 5, 6, 10, 11
Practice exams	20	3	0.12	2, 8, 12, 14
Theory exams	40	4	0.16	9, 5, 6, 7

Bibliography

Bibliography:

Delibes de Castro M (2001) La naturaleza en peligro. Causas y consecuencias de la extinción de especies. Destino. (Reimpres el 2005 i el 2008).

Groom MJ, Meffe GK, Carroll CR i contribuïdors (2006) Principles of conservation biology. Tercera edició. Sinauer.

Juffe-Bignoli, D., Burgess, N.D., Bingham, H., Belle, E.M.S., de Lima, M.G., Deguignet, M., Bertzky, B., Milam, A.N., Martinez-Lopez, J., Lewis, E., Eassom, A., Wicander, S., Geldmann, J., van Soesbergen, A., Arnell, A.P., O'Connor, B., Park, S., Shi, Y.N., Danks, F.S., MacSharry, B., Kingston, N. (2014). Protected Planet Report 2014. UNEP-WCMC: Cambridge, UK. Disponible :

http://www.unep-wcmc.org/system/dataset_file_fields/files/000/000/289/original/Protected_

Kareiva P, Marvier M (2011) Conservation Science: Balancing the Needs of People and Nature. Roberts Publishers.

Primack RB (2014) Essentials of conservation biology. Sisena edició. Sinauer.

Sodhi NS, Ehrlich PR (eds) (2010) Conservation biology for all. Oxford University Press. Gratuït a:

<http://s3.amazonaws.com/mongabay/conservation-biology-for-all/Conservation-Biology-for>

Townsend CR (2008). Ecological Applications. Blackwell

Van Dyke F (2008) Conservation biology. Foundations, concepts, applications. Segona edició. Springer.

Web Links:

Medi natural , Generalitat de Catalunya: amb algú "Medi natural I , Generalitat de Catalunya"

Ministerio de Medio Ambiented'Espanya:

www.magrama.gob.es/es/biodiversidad/temas/default.aspx

AEMA: Agència Europea del Medi Ambient (EEA; European Environment Agency)

www.eea.europa.eu

Medi Ambient, Comissió Europea: http://ec.europa.eu/environment/index_en.htm

CBD: Conveni per a la Diversitat Biològica www.cbd.int

UICN (IUCN): Unió Internacional per la Conservació de la Natura <http://cms.iucn.org>

WCMC: World Conservation Monitoring Centre www.unep-wcmc.org

: www.greenfacts.org/en/digests/index.htm

WWF: World Wide Fund for Nature (World Wildlife Fund) www.panda.org

Conservation International: www.conservation.org

Portal de la "Sociedad de Biología de Conservación de Plantas"

<http://www.conservacionvegetal.org/sebicop.php>