VNIVERSITAT DE VALÈNCIA

Course Guide
33059 Biogeography

COURSE DATA

Data Subject	
Code	33059
Name	Biogeography
Cycle	Grade
ECTS Credits	5.0
Academic year	2018 - 2019

Study (s)

Degree	Center	Acad. year	Period
1100 - Degree in Biology	Faculty of Biological Sciences	4	First term

Subject-matter

Degree	Subject-matter	Character
1100 - Degree in Biology	15 - Complements of biodiversity and conservation	Optional

Coordination

Name	Department
GIL-DELGADO ALBERTI, JOSE ANTONIO	275 - Microbiology and Ecology
MESQUITA JOANES, FRANCESC	275 - Microbiology and Ecology

SUMMARY

The Biogeography module deals with the distribution of organisms, taking into account how they can become integrated on the geographical areas they occupy. This aspect involves the discussion of dispersal and colonization as main processes explaining distribution in varied geographical settings. Altogether, permanence depends on intrinsic and extrinsic organismic traits that act through the above mentioned processes and, consequently, these characteristics are also discussed. In addition, the distribution of organisms also depend on historical reasons, because their presence or absence in particular geographic regions is related to their area of origin and, in some cases, its present space occupation results from extinction in other areas. Therefore, geographic origin and extinction processes are also discussed in this module. The distribution of organisms is usually presented using cartographic tools, which are also presented here, but particularly linked to the dynamics of distribution areas, as these are not static through time, but related to expansions or reductions in occupied space.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Since the presence of organisms in a particular geographic region depends on the abiotic and biotic environment in which it is immersed, it is necessary to know about how organisms are able to adapt to their environment. This process involves responses to the physical and chemical environment and to other organisms sharing this habitat. Consequently, basic knowledge of ecology, zoology and botany are essential.

OUTCOMES

1100 - Degree in Biology

- Capacidad de análisis, síntesis y razonamiento crítico.
- Capacidad de organización, planificación y gestión de la información.
- Utilización del lenguaje científico oral y escrito.
- Capacidad de resolución de problemas y toma de decisiones.
- Habilidad para el trabajo en equipo y en contextos multidisciplinares.
- Capacidad de análisis crítico de textos científicos.
- Apreciación del rigor, el trabajo metódico, y la solidez de los resultados.
- Capacidad de utilización de herramientas matemáticas y estadísticas.
- Saber analizar datos usando herramientas estadísticas apropiadas.
- Conocer las interacciones entre especies.
- Conocer los patrones de distribución geográfica de los organismos y sus causas.
- Realizar cartografías temáticas.

LEARNING OUTCOMES

Properly handle computing and bibliographic tools needed to access the main sources of biogeography.

Ability to analyse data, choose appropriate methods, critically evaluate and interpret experimental results in any of their expression ways.

To construct synopsis and critics from reading and understanding scientific texts.

Ability to use oral presentations in front of a public auditory and explain and debate on a polemic question or topic.

To know the use of basic laboratory scientific instruments in Biology.

To know the basic field tools and general concepts on data gathering and sampling.

Soundness in basic biogeographic knowledge.

To get familiar with technics used in studying processes and patterns in biogeography.

Ability to detect biogeographic patterns in fragmented environments.

Ability to compare different samples and environments.

Use theoretical models applied to real data and recognise the fit (or its lack) of real data to models.

SOCIAL ABILITIES.

To develop abilities for critical thinking, promoting communication and discussion of contents in order to stimulate individual creative capacity.

Ability to work in a team when facing to difficult situations in a collective approach.

Ability to argue from rational criteria, differentiating clearly what is an opinion from what could be a fact or accepted scientific evidence.

Ability to interact both with professors and companion students. Interest for the social and economic application of science and for scientific vulgarisation and the implications of scientific knowledge for culture and social conscience.

Professional capacitation. Acquisition of scientific and technical knowledge related to Biology that would allow developing professional and civic responsibilities in a society under continuous technological growth.

Ability to solve problems related to biogeography: distribution and conservation of organisms.

Ability to choose appropriate work methods and techniques. Propose solutions to environmental problems such as habitat fragmentation.

DESCRIPTION OF CONTENTS

1. Introduction

Biogeography: definition, history, geography and positioning among biological sciences (1 hour)

2. Historic biogeography

Phylogeography and areal changes. Changes during the Pleistocene-Holocene. Miocene-Pliocene. Palaeocene-Oligocene (7 h)

3. Distribution patterns

Aerography. The study of the distribution of living organisms. Biogeographic regions (2 hours)

4. Patterns and processes: dispersal

Patterns and processes that explain the distribution of living organisms. Past and present. Dispersal. Types of dispersal. Barriers. Nature and types of barriers. Intrinsic and extrinsic factors that facilitate or difficult dispersal processes (4 hours).

5. Colonization

Colonization: intrinsic and extrinsic factors that facilitate or difficult colonization processes (1 hours)

6. Fast biogeographical processes

Changes related to global warming. Biological invasion processes (4 hours).

7. Island biogeography: theory and applications to conservation

Island biogeography. Traits of insularity. Number of species. Saturation of communities. SLOSS. Hot spots. Metapopulations (3 hours)

8. Continental patterns

Continental patterns. Diversity gradients. Ecogeographic rules. Causes (2h)

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	24,00	100
Laboratory practices	18,00	100
Tutorials	6,00	100
Computer classroom practice	2,00	100
Development of group work	4,00	0
Development of individual work	16,00	0
Study and independent work	8,00	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	20,00	0
Preparation of practical classes and problem	10,00	0
Resolution of case studies	5,00	0
Resolution of online questionnaires	2,00	0
TOTAL	**125,00**	

TEACHING METHODOLOGY

The module consists of a mixture of theoretical and practical contents. The practical activities will attempt to be developed in the Monfragüe National Park. It will consist on the recognition of living organisms and tabulation and analysis of collected data. In addition, some informatics lab practicals will be carried out.

EVALUATION

The student knowledge will be evaluated taking into account both practical and theoretical aspects. Theoretical concepts account for 75 % of the final marks, while practical knowledge account for 25%. This last part will include the development of practical work, solving problems and works derived from writing tasks. The theoretical part includes knowledge acquired during theoretical and tutoring classes so as seminars. The theory can be evaluated either with a written exam including both open and test type questions or with an oral presentation including questions by the professors on different aspects of the presentation and the theory. The practical part will be evaluated by means of an essay built based on the data collected by each student in the field work. It will be compulsory to obtain a minimum of 40% on each part (theory and practical topics) to be able to calculate the final mark. Otherwise, the student won't be able to pass the topic, and the mark will correspond to the minimum mark obtained in each of both parts (calculated on a maximum mark basis of 10 points). In any case, each student should pass a test exam prior to the evaluation of the theoretical aspects in order to get the final marks.

To request the advancement of the subject call, students must have completed the compulsory activities indicated in the course guide.

REFERENCES

Basic

- Ladle, R. & Whittaker, R.J., 2011. Conservation Biogeography. Oxford Univ. Press
- Lomolino, M. V. Riddle, B. R. and Whittaker, R. J. 2017. Biogeography, 5th Edition. Sinauer.
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Additional

- Brown, J. H., 1995. Macroecology. University of Chicago Press, Chicago.
- Cox, C. B. & Moore, P. D., 1980. Biogeography: an ecological and evolutionary approach. Blackwell, Oxford.
- Fernández-Palacio, J. M. y Morici, C. (Editores). 2004. Ecología Insular. AEET y Excmo. Cabildo Insular de La Palma. Rumagraf
- Hengeveld, R., 1990. Dynamic biogeography. Cambridge University Press, Cambridge.
- MacDonald, G., 2003. Biogeography. Introduction to space, time and life. Wiley, NY.
- Meaza G. (Ed.), 2000. Metodología y práctica de la Biogeografía. Ediciones Serbal, Barcelona
- Myers, A.A. & Giller, P.S., (Eds.), 1988. Analytical Biogeography. Chapman & Hall, London.
- Rosenzweig, M. L., 1995. Species diversity in space and time. Cambridge University Press, Cambridge.
- Spellerberg, I. F. & Sawyer, J.W.D., 1999. An introduction to applied biogeography. Cambridge University Press, Cambridge.