



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Biogeografia

2627-1-F0602Q137

Aims

Biogeography is a fascinating science of synthesis that combines knowledge from various other scientific fields, even genetics or paleontology, in addition to the physiological and ecological aspects of organisms. Biogeography means studying the distribution of living beings in time and space, also investigating their causes. It is a very intriguing science that allows one to face modern issues and reach various parts of the world both far and near. The student may also be interested in this teaching because it allows one to develop an overview of various disciplines, to further understand the temporal and spatial projections of the various biological mechanisms.

1. Knowledge and understanding. The student will come to know the distribution patterns of organisms in space and time; She or he will be able to explain what historical, biological and ecological factors have been identified to explain these patterns.
2. Applying knowledge and understanding skills. Upon completion of the course, the student will be able to understand scientific works in the biogeographical field, including methodological details, and to apply the knowledge in an operational environment and to case studies in the biogeographical field.
3. Making judgment. The student should be able to process what has been learned and be able to recognize situations and problems in which the principles explained in the course can be used to explain the geographical distribution of current to past living through the analysis of case studies and in-depth study of the theory and examples shown in class. Individual in-depth activities (e.g., responding to surveys in light of experience or critical reflection) are carried out in class.
4. Communication skills. At the end of the teaching, the student or student will be able to express himself or herself appropriately in describing the issues addressed with propriety of language and confidence of exposition, thanks to the first-person writing and presentation of a case study from the literature, as well as having prepared for the examination appropriately in this regard by, for example, composing the terms used in class. In addition, during group discussion following individual activities, it will be possible to practice communication in the field.
5. Learn skills. By the end of the teaching, the student will be able to consult the literature on the topics covered and will be able to analyze, apply, integrate and connect the knowledge acquired with what will be learned in related teaching in biological evolution and ecology. The lecturer will provide both specially prepared lecture materials, literature and books to supplement the topics covered and actively answer

questions raised in class.

Contents

The course will deal with the study of organism distribution in an integrated and multi-level way. The teaching is based on the three main strands of biogeography, namely ecological biogeography, historical biogeography, systematic biogeography, and also deals with aspects related to evolution, speciation, conservation, the life history, islands and the distribution of organisms.

Detailed program

The course provides the theoretical and applied foundations of biogeography, integrating ecological, historical, and evolutionary approaches to the study of species distributions. Key biogeographical concepts will be examined, including geographic range, dispersal, migration, population dynamics, endemism, and biodiversity hotspots, as well as the processes of speciation, adaptive radiation, and extinction. Particular attention will be devoted to island biogeography, theories of insularity, and the evolutionary mechanisms shaping island communities. The course will also cover phylogeography, historical biogeography, and the processes that have shaped biodiversity patterns through geological time, with emphasis on the roles of climatic change, tectonic movements, vicariance, and dispersal. Biogeographical regions, terrestrial and aquatic biomes, latitudinal and altitudinal biodiversity gradients, and organism–environment relationships will be explored. The final part of the course will focus on conservation biogeography, including biogeographical and phylogeographical criteria for biodiversity conservation, the ecology and spread of alien species, and the main factors responsible for range contractions and species extinctions. The programme will be complemented by specialist seminars on the biogeography of scleractinian corals, the ecology of island pollinators, and phylogenetic approaches to biodiversity studies.

Prerequisites

The main concepts of Ecology are of fundamental importance, and the basic concepts of Zoology, Botany and Biological Evolution are also necessary. Propaedeutic teachings: None

Teaching form

Lectures in classroom supported by multimedia presentations, scientific articles for recent case studies, didactic seminars by experts.

- 19 2-hour lessons held in person.
- 2 lessons of 2 hours held in interactive mode in person.

Textbook and teaching resource

The entire teaching material used in the lectures will be made available to students in pdf and via the e-learning platform (presentations and articles).

Textbooks (suggested)

Zunino M., Zullini A. 2004. Biogeografia. La dimensione spaziale dell'evoluzione. Casa Editrice Ambrosiana, 374 pp.

Lomolino, M.V., Riddle, B.R. and Whittaker, R.J. 2017. Biogeography, 5th Edition. Oxford University Press, 754 pp.

Semester

Spring semester

Assessment method

The oral examination consists of a presentation and critical discussion of a scientific paper, previously agreed upon by the student and the lecturer, addressing topics covered in the course. This will be followed by the analysis and interpretation of a chorotype model. Subsequently, the student's knowledge of the topics included in the course syllabus will be assessed. During the examination, students are expected to demonstrate their ability to integrate and connect the different topics covered throughout the course. They must also show that they can clearly and effectively communicate the knowledge acquired, demonstrating a thorough understanding of the subject matter and the appropriate use of scientific terminology.

The presentation of the article can be anticipated and take place during the lessons so that it is useful as a presentation of case studies.

Evaluation Criteria: evaluation of scientific and technical knowledge regarding the subjects, critical and individual reworking skills of experimental problems assigned by teachers, communication and reasoning skills, correct use of technical language.

There are no in-itinere exams planned.

Office hours

On appointment. Please write to the lecturer directly by email: paolo.biella@unimib.it

Sustainable Development Goals

LIFE ON LAND
