

**COURSE DATA****Data Subject**

Code	33058
Name	Geobotany
Cycle	Grade
ECTS Credits	5.0
Academic year	2023 - 2024

Study (s)

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

Subject-matter

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

Coordination

Name	Department
GARILLETI ALVAREZ, RICARDO	32 - Botany
SORIANO GUARINOS, PILAR	32 - Botany

SUMMARY

This course aims to show the student the generic richness of the concepts of biogeography applied to plants, and provide them with useful theoretical and practical tools for the professional development. It is a synthesis and integrating discipline, focused on the recognition of "differences regarding to the distribution and the common life of plant, to assess the general features and the rules governing these facts and clarify the causes of them (SITTE et al., 1994). The name Geobotánica traditionally used among the Spanish botanists is synonymous of Phytogeography, so its origin is in the works of A. von Humboldt (1769-1859). It is currently considered as a part of the Biogeography.

To achieve this, the subject is divided into two main parts: the first is the study of the plants distribution area, their types and causes, as well as to identify the biogeographic historical and geological information, provided. The second part is devoted to the techniques of study and description of vegetation. Due to the importance of vegetation in the landscape, its observation is the first step to understand the natural environment of an area. Moreover, the interpretation of their development level and the importance that their different units (plant communities and their taxa) may have is a basic task for understand exactly the conservation status of a zone and its general importance. The main objective of this subject is to equip



students with the tools needed to assess the landscape anywhere in the world from a biogeographic perspective, including ecological, historical, dynamic, and genetic or purely aerographic aspects. Equally and closely linked to the previous goal is to encourage the students' critical thought and initiative needed to perform tasks specific to a graduate in Biological Sciences.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

This subject describes the result of a number of biological processes closely related to physical parameters, so it is advisable to have general knowledge of some of the events or circumstances involved, such as evolutionary and speciation processes, the dispersal mechanisms of plants, an overview of world geography, and more specifically and in greater detail the Iberian Peninsula and the Mediterranean and Europe surroundings.

OUTCOMES

1100 - Degree in Biology

- Capacidad de análisis, síntesis y razonamiento crítico.
- Capacidad de análisis crítico de textos científicos.
- Comprender las interacciones del hombre con el medio.
- Catalogar y evaluar recursos biológicos.
- Conocer las adaptaciones funcionales al medio.
- Conocer las interacciones entre especies.
- Conocer la estructura y dinámica de las comunidades.
- Conocer los patrones de distribución geográfica de los organismos y sus causas.
- Realizar cartografías temáticas.
- Interpretar el paisaje y restaurar hábitat.
- Capacidad para la planificación de estrategias de conservación.
- Muestrear y caracterizar comunidades y ecosistemas.

LEARNING OUTCOMES



The student must be able to recognize and interpret different situations related to the distribution of plants and communities and the causes involved. More concretely, must be able to:

- Distinguish the existence of specific plant distribution patterns and understand the causes of these patterns.
- Understand how the world can be divided according to plant areas.
- Recognize the causes of different types of vegetation on the planet and what they are.
- Know in general what the dominant vegetation types in the Iberian Peninsula and what the physical and biological processes that originate them are

DESCRIPTION OF CONTENTS

1. PLANT AREAS

Cosmopolitanism and reduced areas. Discontinuity: disjunctions. Decline of the area: relict, shelters and their consequences. Vicariant areas: geographical and ecological vicariance. Main vicariance present in the Iberian Peninsula and Canary Islands. Endemicity. Origin and classification of endemism. The endemicity in the Iberian Peninsula. Allochthonous, naturalized and invasive flora.

2. BIOCLIMATOLOGY

Bioclimatic indices. Bioclimatic diagrams. Types of classifications. Bioclimatic classification systems. Bioclimatic belts. Thermotipes and ombrotypes. Macrobioclimas of the Earth.

3. FLORISTIC SECTORIZATIONS

Patterns of floristic global richness (distribution in the ideal continent and its application in the real world ...). Territories, courtship and floristic elements. Chorological floristic richness and range. Floristic sectorizations. floristic kingdoms

4. VEGETATION DESCRIPTION

Factors that determine the vegetation. Physiognomy and structure of vegetation. Vertical and horizontal structure. Dynamics.

5. THE IBERIAN FLORA

Origin, chorological elements, richness, systematic and geographic patterns of endemicity. Floristic sectorization of the Iberian Peninsula.

**6. ENVIRONMENTAL CHARACTERISATION OF THE IBERIAN PENINSULA**

Geographical location, climatology, topography, rock types of the Iberian Peninsula.

7. CHARACTERISATION OF THE IBERIAN VEGETATION

CLIMATIC VEGETATION: Introduction. Biomes represented in the Iberian Peninsula. Euro-Siberian and Mediterranean region. The Mediterranean vegetation. Characteristics and history. Sclerophyllous forests, coniferous and marcescent. Shrub and herbaceous species. The vegetation of the Comunidad Valenciana (Balearic- Catalanian- Provençal, Murcian-Almerian and Mediterranean- central iberian Provinces). The Eurosiberian Vegetation: Deciduous forests. Coniferous forests. Shrub and herbaceous species.

VEGETATION AND SOIL: edapho hygrophilous vegetation, riverbank vegetation, halophytic vegetation, gipsicolous vegetation, nitrophilous and ruderal vegetation (weed vegetation), psammophyte vegetation, aquatic vegetation, rocky vegetation.

8. GEOBOTANICAL ASPECTS AND CONSERVATION

Phytogeographical aspects in Environmental studies. Considerations for the restoration of the vegetation cover. In situ and ex situ conservation of flora and vegetation.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	27,00	100
Laboratory practices	16,00	100
Computer classroom practice	4,00	100
Tutorials	3,00	100
Development of group work	20,00	0
Study and independent work	20,00	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	15,00	0
Preparing lectures	10,00	0
TOTAL	125,00	

TEACHING METHODOLOGY

This subject has been planned to be developed from different complementary perspectives, in which the discussion of the concepts, methods and practical exercises are essential for the formation and the achievement of the final objectives



The ways to achieve it are: 1) lectures, 2) practical classes in computer lab and field, and 3) field work.

- **Lectures.** The theoretical development of the subject will be based on the lecture, where exposure of the concepts will be framed in a particular way in the context of other subjects on the itinerary. In the result of the discussion generated during the presentation of the issues the learners active participation is crucial and it could raise issues suitable for discussion in the form of tutoring.

- **Practical classes.** Based on fictional or real situations, some of the methods outlined in the lectures will be applied, serving as the basis for the development of a simple field work and / or laboratory. A breakdown and analysis of the activities is vital to strengthen the application of scientific method. Practical classes will be carried out in the lab and field. **Field work.** The field trips allow students to start on-site interpretation of vegetation and its response to ecological conditions (with a bibliographic support necessary) and recognize the different protected areas integrated into the various figures of conservation of the Valencian Community. This activity is of primary importance to their future career. It will consist of several field days, which can be grouped into one or more excursions. The itinerary will be chosen to be as diverse as possible from a botanical perspective, and it will vary depending on the phenological conditions of each year. Students must submit a report evaluation of the activities undertaken in this outing. **Computer practice.** They will focus on Bioclimatology and charting bioclimatic diagrams, the interpretation and comparison of data from different bioclimatic classifications and the relationship of climate data with plant response in different territories.

EVALUATION

Theory and practices (including seminars) will be considered in the evaluation of the subject. The respective percentages in the final mark are:

Theory: 70%

Practice: 30%

- The evaluation of the theoretical aspects of the subject will be carried out through a two-part exam. The first part will include thematic units 1, 3–6 and the second part, units 2, 7–8. Both parts will be evaluated independently on 5.0, adding up to obtain the final mark. In the event that in the first call a grade of 2.0 is not reached in one of the parts, it will be considered that said part has not been passed and must be repeated in the second call. In this, each of the parties must reach the grade of 1.5 in order to be compensable with the result of the other party.
- The practicum will be evaluated by an exam of field practice and a review of the part developed of the computer room (included in the theoretical exam).
- It will be necessary to pass both theory and practicum in order to pass the subject.

To apply for advance evaluation of this course compulsory activities (practicum) should have been passed.



REFERENCES

Basic

- ALCARAZ ARIZA, F. J. 1999. Manual de teoría y práctica de Geobotánica. D.M. ICE Universidad de Murcia.
- ARCHIBOLD, O. W. 1995. Ecology of World vegetation, Londres, Chapman & Hall.
- BELLOT, F. 1976. Breve historia de los métodos de descripción y clasificación de la vegetación. Memorias de la Real Academia de Farmacia, 52(1): 61-79.
- BOLÒS, O. de. 1963. Botánica y Geografía. Memorias de la Real Academia de Ciencias de Barcelona, 34: 433-480.
- BUREL, F. Y J. BAUDRY. 2002. Ecología del Paisaje. Conceptos, métodos y aplicaciones. Ediciones Mundi-Prensa, Madrid.
- CAIN, S. A. 1971. Foundations of Plant Geography, 2ª ed., Nueva York, Harper & Bros.
- COSTA, M., C. MORLA, H. SAINZ, eds. (1997). Los bosques ibéricos. Una interpretación geobotánica. 572 pp. 3ª reimpresión 2005. Ed. Planeta, Barcelona.
- EHRENDORFER, F. 1994. Geobotánica, en Tratado de Botánica, 8ª ed. española, Barcelona, Omega.
- GARILLETI, R., LARA, F. & J. A. CALLEJA. 2012. Vegetación de los ríos y ramblas de la España meridional (península y archipiélagos). Ministerio de Agricultura, Alimentación y Medio Ambiente. Madrid.
- LARA, F., R. GARILLETI & J. A. CALLEJA. 2007. La vegetación de ribera de la mitad norte española (2ª ed.). Centro de Estudios y Experimentación de Obras Públicas. Ministerio de Fomento. Madrid
- LOMOLINO, M. V., B. R. RIDDLE, R. J. WHITTAKER & J. H. BROWN. 2010. Biogeography, 4th ed. Sinauer Associated, Sunderland
- MOLINIER, R. & P. VIGNES. 1967. Introducción a la Ecobiocenología, Barcelona, Vicens Vives.
- OZENDA, P. 1982. Les végétaux dans la Biosphère, París, Doin.
- POLUNIN, N. 1967. Eléments de Géographie Botanique, París, Gauthier-Villars.
- SAINZ OLLERO, H. & J.C. MORENO SAIZ (2002). Flora vascular endémica española. En F.D. PINEDA, J. M. de MIGUEL, M.A. CASADO & J. MONTALVO (coords.): La Diversidad Biológica de España: 175-195. CYTED. Prentice Hall, Madrid.
- TAKHTAJAN, A. 1986. Floristic regions of the World. Berkeley, Berkeley University Press.
- VIGO, J. 2005. Les comunitats vegetals. Descripció i classificació. Universitat de Barcelona
- WALTER, H. 1985. Vegetation of the Earth and ecological systems of the Geo-Biosphere, 3ª ed. rev. aum., Berlín, Springer.



Additional

- BOHN, U., G. GOLLUB, C. HETTWER, Z. NEUHÄUSLOVA, T. RAUS, H. SCHLÜTER & H. WEBER (comp. & rev.) 2004. Karte der natürlichen Vegetation Europas / Map of the natural vegetation of Europe 1: 2.500.000. Bundesamt für Natur schutz / Federal Agency for Nature Conservation, Bonn.
- MAAREL, E. van der (2005). Vegetation ecology. Blackwell Publishing, Oxford. 395 pp.
- McCUNE, B. & J. B. GRACE & D. L. URBAN (2002) Analysis of Ecological Communities. MJM Software Design, Gleneden Beach, Oregon. 300 pp.
- MILLER, R. W. & R. L. DONAHUE (1990). Soils. An introduction to soils and plant growth. Prentice-Hall International, Inc. Englewood Cliffs, New Jersey. 768 pp.
- RIVAS-MARTÍNEZ, S. 1987. Mapa y Memoria del Mapa de series de vegetación de España, Madrid, ICONA.
- RIVAS-MARTINEZ, S.; FERNÁNDEZ-GONZÁLEZ, F.; LOIDI, J.; LOUSÃ, M. Y PENAS, A. 2001. Syntaxonomical checklist of vascular plant communities of Spain and Portugal to association level. Itinera Geobotanica 14: 5-341.
- TERRADAS, J. 2001. Ecología de la vegetación. Ed. Omega, Barcelona.