



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze della Terra e del Mare		
<b>ACADEMIC YEAR</b>	2019/2020		
<b>MASTER'S DEGREE (MSC)</b>	NATURAL SCIENCES		
<b>INTEGRATED COURSE</b>	BIOGEOGRAPHY - INTEGRATED COURSE		
<b>CODE</b>	20538		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	2		
<b>SCIENTIFIC SECTOR(S)</b>	BIO/03, BIO/05		
<b>HEAD PROFESSOR(S)</b>	ILARDI VINCENZO	Professore Associato	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	MARRONE FEDERICO	Professore Ordinario	Univ. di PALERMO
	ILARDI VINCENZO	Professore Associato	Univ. di PALERMO
<b>CREDITS</b>	9		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	2		
<b>TERM (SEMESTER)</b>	1° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<p><b>ILARDI VINCENZO</b></p> <p>Monday 09:30 13:30 Studio del docente, previo appuntamento telefonico.  Tuesday 09:30 13:30 Studio del docente, previo appuntamento telefonico.  Wednesday 09:30 13:30 Studio del docente, previo appuntamento telefonico.  Thursday 09:30 13:30 Studio del docente, previo appuntamento telefonico.  Friday 09:30 13:30 Studio del docente, previo appuntamento telefonico.</p> <p><b>MARRONE FEDERICO</b></p> <p>Monday 10:00 11:00 Via Archirafi 18, primo piano, stanza I8  Tuesday 15:00 17:00 Sede del Consorzio Universitario, corso Vittorio Emanuele, 92, 93100 Caltanissetta  Wednesday 10:00 11:00 Via Archirafi 18, primo piano, stanza I8  Friday 10:00 11:00 Via Archirafi 18, primo piano, stanza I8</p>		

DOCENTE: Prof. VINCENZO ILARDI

<b>PREREQUISITES</b>	Basic knowledge of general and systematic botany and zoology
<b>LEARNING OUTCOMES</b>	<p>Knowledge and understanding ability</p> <p>Acquisition of techniques and cognitive tools needed for reading, sampling, analysis and evaluation of the biological component (animal and vegetatal) of the Palearctic Region with particular reference to the Mediterranean area.</p> <p>Acquisition of knowledge for understanding adaptations of plants and animals to different environments.</p> <p>Ability to apply knowledge and understanding</p> <p>Ability to analyze, describe and elaborate technical documents, including maps, functional to activities of study.</p> <p>Ability to analyze, diagnose and evaluate the macroscopic biological component of ecosystems.</p> <p>Ability to analyse, diagnose and evaluate diagnosis and evaluation of the macroscopic biological component of ecosystems.</p> <p>Ability to understand, interpret and summarize geological, geomorphological, soil and climate data, etc. connected to the ecological needs of the biological component, with particular reference to Mediterranean area species .</p> <p>Making judgements</p> <p>The course provides data, methods and expertise in the field of biogeography, functional to the evaluation and choice, in full autonomy, of the most appropriate techniques and methods to be used whenever they are requested.</p> <p>Ability to join inter- and transdisciplinary study and working groups.</p> <p>Communication skills</p> <p>Acquisition of disciplinary specialized terminology necessary for the interpretation and the correct presentation of the results of the surveys in the field of the Mediterranean area biogeography.</p> <p>Learning ability</p> <p>Learning of the research techniques of specific bibliographic materials of geobotanical disciplines. Aptitude for integration and interaction in professional field within workgroups thanks to the acquired knowledge. Possibility of participation in seminars, congresses, specialization courses or masters in the field of the biogeography.</p>
<b>ASSESSMENT METHODS</b>	Oral exam on the topics covered in the classroom or verified during excursions.
<b>TEACHING METHODS</b>	Frontal lessons integrated with excursions (1 C.F.) projection of original images, and the support of papers.

## MODULE ZOOGEOGRAPHY

*Prof. FEDERICO MARRONE*

### SUGGESTED BIBLIOGRAPHY

- Biogeografia – Zunino & Zullini – Casa Editrice Ambrosiana
- Biogeography, fourth edition– Lomolino et al. – Sinauer Press

<b>AMBIT</b>	20987-Attività formative affini o integrative
<b>INDIVIDUAL STUDY (Hrs)</b>	51
<b>COURSE ACTIVITY (Hrs)</b>	24

### EDUCATIONAL OBJECTIVES OF THE MODULE

The main educational objective of the class is to provide to the students the necessary theoretical and practical knowledge to investigate and interpret the diversity patterns of modern biota, based both on historical and ecological perspectives. Moreover, the Class will provide a basic knowledge of the Sicilian and Italian biotas in the frame of the West-Palearctic fauna, with a special focus on the "good practices" aimed at the monitoring and managing of species and ecosystems.

## SYLLABUS

Hrs	Frontal teaching
2	Introduction to the discipline
4	The geographica ranges of the taxa: definition, assessment, mapping
4	Systematic zoogeography
4	Vicariance and dispersal processes
4	Phylogeography
4	The fauna of Sicily
2	Conclusive review and class papers discussion

## MODULE GEOBOTANY

*Prof. VINCENZO ILARDI*

### SUGGESTED BIBLIOGRAPHY

Pignatti S., 1994 – Ecologia del paesaggio. UTET.  
 Ubaldi D., 2003 – Flora, Fitocenosi e Ambiente. Elementi di Geobotanica e Fitosociologia. CLUEB  
 Lomolino M.V., Riddle B.R., Whittaker R.J. – 2016. Biogeography. Biological Diversity across Space and Time. Fifth Edition. Sinauer Associates, Inc.

<b>AMBIT</b>	50511-Discipline ecologiche
<b>INDIVIDUAL STUDY (Hrs)</b>	98
<b>COURSE ACTIVITY (Hrs)</b>	52

### EDUCATIONAL OBJECTIVES OF THE MODULE

The course aims to train students able to analyse the plant topsoil from the point of view both of flora and vegetation within the Mediterranean Region. The primary objective is the acquisition of techniques of sampling, processing and interpretation of data related to the floristic and phytocoenotic component, this latter analysed with synchronic and diachronic methodology. The course aims also to provide the necessary tools to analyse the plant landscapes at any scale required (species, plant communities, vegetation series, landscape) and to represent them cartographically. Moreover, it aims to provide the cognitive tools necessary in the assessment of human impacts on biodiversity and in its planning and management.

## SYLLABUS

Hrs	Frontal teaching
2	Generalities and definitions in Geobotany. Historical notes and relationships to other other Sciences.
2	Phylogeny and phytogeography. Speciation and radiation.
2	Concepts of palaeobotany. Evolution of the plants and Plate Tectonics. From the colonization of the land to the appearance of phanerophytes. Genesis of the Mediterranean sea. From the Cretaceous to the Messinian salinity crisis.
2	Origin and evolution of the Mediterranean flora, with particular reference to the flora of Italy and Sicily.
2	Glaciations of the Quaternary, refuge areas, and evolutionary and speciation processes connected (hybridization, polyploidy, apomixis).
2	Centers of origin and distribution of the species. Geographic ranges of the species. Methods of construction and representation of geographic ranges. Change (regressions and expansions) in the geographic ranges.
2	Definition of the concept of flora. Method of flora census according to a geographic grid. Chorological types and chorological spectrum.
2	Geographic ranges of the species of the Mediterranean flora. Floristic territories. Floristic kingdoms, regions, provinces and districts. Endemic species.
2	The Mediterranean component of the flora of the Mediterranean Region (Steno-Mediterranean and Euro-Mediterranean species). Widely distributed species. The Eurosiberian, European, North African and Eastern components of the Mediterranean flora. Life forms and biological spectrum.
2	Ecological factors (climatic, edaphic, topographic and biotic) and adaptations. The climate, climatic factors and elements. Bioclimatic classification. The bioclimates of the Mediterranean.
2	The substrate. Latitudinal and altitudinal distribution of the soils. The ontogenetic cycle and dispersal strategies. Intraspecific competition and interspecific competition. R selection and K selection.

2	The study of the vegetation. Basic principles. Factors that determine the distribution of plant communities: the climate, the fire. Occupation of the space and relationships between plants, physiognomic communities and elementary populations, the plant communities.
4	Classification of the vegetation, the plant association and the other syntaxonomic units. The phytosociological nomenclature. The phytosociological relevé and the syntaxonomic attribution. The levels of phytosociological study: classical, serial and landscape phytosociology. History of the vegetation of the Mediterranean with particular reference to the vegetation of Italy and Sicily: from Messinian to postglacial.
2	The competition for the resources, population dynamics and vegetation successions. The vegetation series. Edaphic series and climatophilous series. Regressive series and progressive series. Climax and durable vegetation. Integrated or landscape phytosociology. Vegetation mosaics, tesseras and sigmeta. The diachronic study of the vegetation: the permanent squares. Actual vegetation and potential vegetation.
2	The cartographic representation of the vegetation: actual vegetation map, potential vegetation map, land use map, naturalness degree map, vegetation series map, etc.
2	Relationships between human activities and natural environment. Analysis of the vegetation expressions of greater phytogeographical interest in the Mediterranean. Woodlands, shrubs and grasslands of the Mediterranean Region.
4	The plant communities of the Mediterranean coastal environment and conservation issues. The communities of rivers, lakes and wetlands in general. The phytocoenoses of the environments disturbed by man. Exotic species and invasive species.
2	The contribution of geobotany in the planning and management of the natural resources.
<b>Hrs</b>	<b>Practice</b>
12	Educational excursions