



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2021/2022		
BACHELOR'S DEGREE (BSC)	BIOLOGICAL SCIENCES		
INTEGRATED COURSE	ECO-MORPHOLOGY AND ADAPTIVE STRATEGIES OF PLANTS - WITH PRACTICE		
CODE	19763		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	BIO/03		
HEAD PROFESSOR(S)	GERACI ANNA	Ricercatore	Univ. di PALERMO
OTHER PROFESSOR(S)	TROIA ANGELO	Ricercatore a tempo determinato	Univ. di PALERMO
	GERACI ANNA	Ricercatore	Univ. di PALERMO
CREDITS	6		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>GERACI ANNA</p> <p>Wednesday 9:00 11:00 Via archirafi 38, previa prenotazione tramite portale o per email</p> <p>Thursday 9:00 11:00 Via archirafi 38, previa prenotazione tramite portale o per email</p> <p>TROIA ANGELO</p> <p>Monday 15:00 17:00 Sede del Consorzio Universitario, corso Vittorio Emanuele, 92, 93100 Caltanissetta</p> <p>Tuesday 10:00 12:00 Dipartimento STEBICEF, via Archirafi 20, V piano (previo appuntamento). - NB: Il docente e' pienamente disponibile a concordare giorni od orari diversi da quello specificato, sempre previo appuntamento (per appuntamento, scrivere a: angelo.troia@unipa.it)</p>		

DOCENTE: Prof.ssa ANNA GERACI

PREREQUISITES	Basic knowledge of General and Systematic Botany.
LEARNING OUTCOMES	<p>KNOWLEDGE AND LEARNING OUTCOMES The student will acquire specific information on morphological and functional adaptations and on the adaptive strategies of plants as acquired advantages to live better in their own environment.</p> <p>ABILITY TO APPLY KNOWLEDGE AND COMPREHENSION SKILLS The student will acquire useful expertise in ecology and evolutionary biology, but also in some applicative aspects in the field of plant biology, thanks to the acquirement of specific theoretical, methodological and experimental skills.</p> <p>INDEPENDENT JUDGMENT Theoretical tools enabling critical assessment of fundamental concepts related to plant biodiversity as a results of adaptation to environmental diversity will be provided.</p> <p>COMMUNICATION SKILLS The student will acquire the ability to explain with appropriate scientific language the course topics and the relevant issues of plant biology and ecology. The student will also improve his/her skills of thinking and communicating experimental data, both verbally and practically.</p> <p>LEARNING ABILITY The course aims to develop the ability to observe plant organisms in their environmental context. The course aims to stimulate students in scientific interest in the biological diversity of plants in correlation with the environment. The activities carried out during the practical exercises allow to apply methods of macroscopic and microscopic analysis of the samples, offering the student opportunities for experimental observation, comparison and verification of what has been learned in the lectures.</p>
ASSESSMENT METHODS	<p>The final exam is an oral discussion aiming at checking the acquired knowledge of the course contents.</p> <p>Besides the program topics, the exam also tests and assesses the possession of analytical and deductive reasoning, independent judgment and interdisciplinary connection ability, adequate language and speaking skills.</p> <p>Students must answer at least three questions – for each module - on key topics of the course program. Sufficient results are achieved by demonstrating a general level of knowledge and understanding of the course contents, as well as language and speaking ability at least consistent with the level of a master degree. The score is out of thirty, ranging from 18/30, that corresponds to a sufficient evaluation, to 30/30 cum laude reflecting an excellent performance by all concerned.</p>
TEACHING METHODS	Lectures, tutorials, excursions

MODULE
PLANT ADAPTIVE STRATEGIES WITH PRACTICE

Prof. ANGELO TROIA

SUGGESTED BIBLIOGRAPHY

Mauseth J. (2014). Botanica. Fondamenti di Biologia delle piante. 3a Ed., Idelson-Gnocchi.
Evert R.F. & Eichorn S.E. (2013). La Biologia delle piante di Raven. 7a ed. Zanichelli, Bologna.
Materiale fornito dal docente

AMBIT	10665-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	47
COURSE ACTIVITY (Hrs)	28

EDUCATIONAL OBJECTIVES OF THE MODULE

Aim of the module is to introduce the diversity of forms and functions in plant organisms, as the result of different adaptive strategies to environmental pressures. The functional traits of plants of different biomes will be examined, with a special focus to Mediterranean ecosystems, as well as the vital strategies and life forms of plants linked to different habitats and substrates, stable or differently disturbed. The knowledge acquired will enable the student to use plants as ecological indicators and to analyze flora and vegetation in descriptive or predictive studies, both in ecological or evolutionary contexts.

SYLLABUS

Hrs	Frontal teaching
2	Introduction to the module. Adaptive strategies of plants, diversity of forms and functions. Life forms as a descriptive tool. Grime's plant life strategies.
4	Form and function: case studies in terrestrial and aquatic environments. Observation and classification of plant functional traits.
4	Adaptations of plants to Mediterranean ecosystems: vegetative parts, reproductive structures, dispersal modes.
2	Plant growth strategies under normal and stress conditions; anthropogenic disturbance.
2	Adaptations to extreme conditions: hypersaline, rocky and seasonally flooded habitats.
2	Adaptations to extreme conditions: high mountain habitats.
Hrs	Practice
12	Field trips for the observation and description of plant species and communities in terms of adaptive morphological diversity.

MODULE
PLANT ECO-MORPHOLOGY WITH PRACTICE

Prof.ssa ANNA GERACI

SUGGESTED BIBLIOGRAPHY

Mauseth J. (2020). Botanica. Fondamenti di Biologia delle piante. 4a Ed., Idelson-Gnocchi. ISBN: 978-8879476980
 Mauseth J. (2014). Botanica. Fondamenti di Biologia delle piante. 3a Ed., Idelson-Gnocchi. ISBN: 978-8879475822
 Mauseth J. (2019). Botany: An Introduction to Plant Biology. 7th Ed., Jones & Bartlett Publisher ISBN: 978-1284157352
 Evert R.F. & Eichorn S.E. (2013). La Biologia delle piante di Raven. 7a ed. Zanichelli, Bologna. ISBN:978-8808175045
 Luigi Sanità di Toppi (2018). Interazioni Pianta-Ambiente. Piccin ISBN: 978-8829928705
 Materiale fornito dal docente

AMBIT	10665-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	47
COURSE ACTIVITY (Hrs)	28

EDUCATIONAL OBJECTIVES OF THE MODULE

The morphoanatomical characteristics of plants are the result of the relationships between their gene expression and the influence of the environment in which they grow. The aim of the module is to provide the students the understanding of the different morphological types specialized in response to different environmental factors such as availability of water, light, temperature, nutrients, interactions with other living organisms. The study will also be approached through the application of microscopic techniques. The acquired knowledge will provide students the useful tools as identification of the different structural forms of plants and will be a useful support to approach ecological studies related to plant-environment interactions.

SYLLABUS

Hrs	Frontal teaching
2	Introduction to the module: morphological and functional adaptations; advantages achieved to better live in the environment. General information on the morpho-anatomical characteristics of plants.
6	Morphoanatomical adaptations in response to the availability of water (hydrophytes, hygrophytes, mesophytes, xerophytes).
2	Adaptations in response to the availability of light (sciaphilous plants, heliophilous plants)
2	Adaptations in response to temperature (plants of hot, cold climates, with seasonal variation)
2	Adaptations in response to the availability of nutrients (carnivorous plants, halophilous plants)
2	Interactions with other organisms (production of secondary metabolites)
Hrs	Practice
12	Observation and interpretation of morphotypes. Preparation and staining of fresh herbal preparations: observation and interpretation of characters in relation to the environment.