



# UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2021/2022
BACHELOR'S DEGREE (BSC)	ENVIRONMENTAL ENGINEERING
SUBJECT	APPLIED ECOLOGY
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50278-Ingegneria ambientale e del territorio
CODE	02670
SCIENTIFIC SECTOR(S)	BIO/07
HEAD PROFESSOR(S)	GIANGUZZA PAOLA      Professore Associato      Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	96
COURSE ACTIVITY (Hrs)	54
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	<b>GIANGUZZA PAOLA</b> Wednesday 12:00    13:00

**DOCENTE:** Prof.ssa PAOLA GIANGUZZA

<b>PREREQUISITES</b>	basic knowledge of chemistry, mathematics and physics
<b>LEARNING OUTCOMES</b>	<p>Knowledge and ability to understand</p> <p>Acquisition of theoretical and experimental skills related to characteristics abiotic and biotic ecosystems, interactions between organisms and between them and the physical environment and ecosystem functioning. Acquire the basics about the ecological principles that regulate the response of ecosystems to action</p> <p>human in order to propose analysis, monitoring protocols and solutions for alleviate anthropic pressure and adopt mitigation and orientation solutions adaptation to change solutions. Acquisition of a language</p> <p>scientific specialist</p> <p>Ability to apply knowledge and understanding</p> <p>Acquisition of application capabilities in the analysis of ecological processes in relation also to the anthropic alterations.</p> <p>Autonomy of judgment</p> <p>Acquisition of evaluation and interpretation of experimental data; evaluation of the state of the environment and of the effects arising from the activities anthropic.</p> <p>Communication skills</p> <p>Acquisition of adequate skills and tools for communication with reference to the exposure of the results of ecological studies, to transmission and dissemination of information on topics related to the subject of the lessons.</p> <p>Learning skills</p> <p>Acquisition of adequate capacity for further independent study skills, with reference to: consultation of bibliographic material, consultation of databases and other information on the web, cognitive tools of basis for continuous updating of knowledge.</p>
<b>ASSESSMENT METHODS</b>	<p>oral examination. The evaluation of learning will be carried out with an oral test at the end of the course. The grade of 30-30 cum laude will be assigned to the learner who will demonstrate an excellent knowledge of the topics, excellent language properties, good analytical skills, the student is able to apply the knowledge to solve the proposed problems. The vote of 26-29 will be assigned to the learner who shows a mastery of the topics, full propriety of language and ability to apply to apply the knowledge to reply to the proposed questions. The vote of 22-25 will be assigned when a basic knowledge of the main topics is recognized, a good language property, with limited ability to autonomously apply the knowledge to the solution of the proposed problems. The 18-21 vote will be assigned to the student who does not have full mastery of the main topics of teaching, but possesses the knowledge of it, satisfactory language properties, poor ability to independently apply the knowledge. acquired.</p> <p>Insufficient - The student does not possess an acceptable knowledge of the contents of the topics covered in the teaching.</p>
<b>EDUCATIONAL OBJECTIVES</b>	<p>Ecology is the scientific study of the interactions that determine the distribution and abundance of organisms. An applied perspective often refers to how ecology can be applied to management questions to obtain certain goals in landscape recovery. Students will be encouraged to explore current and emerging problems such as the conservation of species, landscape restoration, and mitigation of environmental impacts above all in marine real. The course is suited for those interested in the applied aspects of ecology and environmental sciences for environmental management and consultancy, or for those interested in delivering user-defined integrative solutions via research. The course will provide also fields techniques and methods for monitoring wild and habitat species, including experimental and sampling design, data collection, statistical analysis of data.</p>
<b>TEACHING METHODS</b>	teacher up front lessons
<b>SUGGESTED BIBLIOGRAPHY</b>	<p>Odum E. (1994), Ecologia per il nostro ambiente minacciato, Ecologia Antonio Pusceddu, Gianluca Sarà, Pierluigi Viaroli UTET Università Anno edizione: 2020</p> <p>Ricklefs R. (1999) L'economia della natura. Zanichelli</p> <p>Galassi S, Ferrari I, Viaroli P (2014) Introduzione all'ecologia applicata. Dalla teoria alla pratica della sostenibilit�</p> <p>Materiale didattico fornito dal docente</p> <p>Cunningham P. W. e M. Ann Cunningham (2003) Ecologia applicata</p>

## SYLLABUS

Hrs	Frontal teaching
14	Basic concepts: The energy environment and the flow of energy. The biological conversion of solar energy. Primary and secondary production in ecosystems. Microbial conversion of the main elements in the environment. Structure, size, dispersion and distribution. Distribution areas. Population growth models and control factors (extrinsic and intrinsic factors). Symbiotic interactions: competition, predation and parasitism, amensalism, commensalism, mutualism. The demostatic system. Logistic equation. Population dynamics. Pyramids of age. Strategies r and K. Bearing capacity. Resilience and resistance.
10	Approach to aquatic ecosystems: Elements of limnology: The lacustrine fluvial network. Morphology and morphometry of the lake basin. Lakes' optical properties Lakes thermal properties Lake water movements - Chemical characteristics of lake waters Classification of aquatic ecosystems and analysis of the biotic component. Fluvial ecosystem: the four dimensions, the metabolism, spiraling processes. The marine ecosystem: Elements of physical and chemical oceanography. Zoning in the Mediterranean: planes and belts in the phyto system Community of the marine environment along the coastal strip: hard and mobile substrate communities. Eutrophication of surface water bodies and protection of water resources: responsible factors. Identification of loads from point and diffused sources. Classification of internal waters.
4	Ecological theory and its application to conservation biology
6	The concept of sustainable development; Policy and Operational Implication
2	Ecology, Conservation and Extinction
12	Assessing the Impacts of Biodiversity Changes on Ecosystem Services. The threats & problems affecting species and their survival Impact of habitat loss on species Theory of Island Biogeography Minimum Population Size (MVP) and Population Viability Analysis (PVA) Metapopulation Dynamics The Importance of Connectivity
2	Different Strategies for Protecting Biodiversity: the role of MPAs
6	Impact of climate change
4	Invasive species management
4	Seagrass meadows: Dynamics and evolution. Role in the balance of the coastal strip. Importance from an energetic, dynamic-structural point of view and maintenance of biodiversity. Causes of natural and anthropogenic regression. Structural, phenological and lepidochronological analysis - Recovery of degraded mobile backdrops - Interventions and problems of transplantation and reforestation