UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Ingegneria
ACADEMIC YEAR	2023/2024
BACHELOR'S DEGREE (BSC)	ENVIRONMENTAL ENGINEERING FOR SUSTAINABLE DEVELOPMENT
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	**GIANGUZZA PAOLA** Wednesday 12:00 13:00

DOCENTE: Prof.ssa PAOLA GIANGUZZA

PREREQUISITES	A basic understanding of biology, zoology and botany and general ecology is required.
LEARNING OUTCOMES	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.
ASSESSMENT METHODS	EXAM: final oral tests. The student will be evaluated based on the level of knowledge of the subjects and the ability to link between them, the clarity and the use of a specialized scientific language. EVALUATION CRITERIA -assessment: excellent, grade: 30 - 30 cum laude, excellent knowledge of the topics of the course, excellent use of language, excellent analytical capacity, ability to apply knowledge to problem solving; - assessment: very good, grade: 26 29, good knowledge of the topics of the course, correct use of language, good analytical capacity, ability to apply knowledge to problem solving; - assessment: good, grade: 24 25, good knowledge of the main topics of the course, correct use of language, limited ability to autonomously apply knowledge to problem solving; - assessment: satisfactory, grade: 21 23, partial knowledge of the topics of the course, satisfactory use of language, limited ability to autonomously apply knowledge to problem solving; - assessment: sufficient, grade: 18 20, minimal knowledge of the main topics of the course and of technical language, scarce ability or inability to autonomously apply knowledge to problem solving; - assessment: fail, insufficient knowledge of the topics of the course
EDUCATIONAL OBJECTIVES	Achieve a comprehensive understanding of research based applied ecology and conservation within an interdisciplinary scientific framework Discuss appropriate ecological, mathematical, and statistical concepts and methods to interpret, understand and communicate wildlife ecology and conservation data. Have a broad knowledge of the range of relevant techniques available on marine and terrestrial conservation
TEACHING METHODS	teacher up front lessons
SUGGESTED BIBLIOGRAPHY	Conservation Biology. Chapman & Hall, New York. Frankham R. et al., 2002. Ecologia di Antonio Pusceddu, Gianluca Sarà, Pierluigi Viaroli UTET UNIVERSITA' 2020

SYLLABUS

Hrs	Frontal teaching
10	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.
6	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
10	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

SYLLABUS

Hrs	Frontal teaching
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