



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze della Terra e del Mare
ACADEMIC YEAR	2019/2020
MASTER'S DEGREE (MSC)	MARINE BIOLOGY
SUBJECT	MARINE ECOLOGY
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	50506-Discipline del settore biodiversità e ambiente
CODE	13834
SCIENTIFIC SECTOR(S)	BIO/07
HEAD PROFESSOR(S)	VIZZINI SALVATRICE Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	98
COURSE ACTIVITY (Hrs)	52
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	1° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	VIZZINI SALVATRICE Monday 11:00 13:00 Aula docente: Dipartimento di Scienze della Terra e del Mare, via Archirafi 18, Il piano. Contattare preliminarmente il docente. Wednesday 11:00 13:00 Sede del Consorzio Universitario, corso Vittorio Emanuele, 92, 93100 Caltanissetta. Contattare preliminarmente il docente per email.

DOCENTE: Prof.ssa SALVATRICE VIZZINI

PREREQUISITES	The student is expected to have basic knowledge of General Ecology.
LEARNING OUTCOMES	<p>Knowledge and comprehension Acquisition of theoretical and experimental skills related to marine ecosystems, ecological processes, and the effects of anthropic activities on marine species, populations, communities and ecosystems. Acquisition of a specialised scientific language.</p> <p>Applying knowledge and comprehension Acquisition of application skills to assess environmental status and manage ecosystems.</p> <p>Autonomous thinking Acquisition of evaluation skills and competences for interpretation of experimental data, environmental state assessment and the effects of anthropogenic activities.</p> <p>Communication ability Acquisition of adequate skills and tools for communication, with regard to the presentation of the results of ecological studies, communication and dissemination of information on issues concerning the topics of the lessons.</p> <p>Learning ability Acquisition of appropriate skills for the independent achievement of additional competences, with reference to: literature consultation, access to database and other information on the internet, basic cognitive tools for the continuous updating of knowledge.</p>
ASSESSMENT METHODS	<p>An entry test is carried out to assess the initial preparation of students. The evaluation is based on the results of an optional ongoing written test (mid-term test) and of a final oral exam. The final mark is given by the average of the mid-term test and the final exam (both as a fraction of 30). A positive evaluation of the mid-term test gives the student the opportunity to be evaluated during the final exam of the earliest exam session, on only the contents of the second part of the course, not covered by the mid-term test. The student has the option to refuse the result of the mid-term test before the final exam, which in this case will deal with all the topics of the course.</p> <p>The student is evaluated based on the level of knowledge of the subjects and the ability to link between them, the clarity and the use of a specialised scientific language.</p> <p>Assessment criteria</p> <ul style="list-style-type: none">- 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	The aim of the course is to provide the students with the information needed for the advanced and specialized training in the field of marine ecology and marine ecosystem functioning. In particular, through the study of specific topics and the analysis of case studies, we intend to analyse the interactions between species and the environment with particular attention to the effects of anthropogenic activities.
TEACHING METHODS	Lectures and exercises
SUGGESTED BIBLIOGRAPHY	<ul style="list-style-type: none">• Kaiser M.J. et al., 2011 - Marine Ecology: Processes, Systems, and Impacts. Oxford University Press.• Speight & Henderson, 2010 – Marine Ecology: Concepts and Applications. Wiley-Blackwell.• Appunti e articoli forniti dal docente. <p>Testi per approfondimenti</p> <ul style="list-style-type: none">• Krebs C.J., 2001 – Ecology. Pearson; Benjamin-Cummings.• Danovaro, 2013 – Biologia Marina. CittaStudi Edizioni.• Michener R. & Lajtha K., 2007 - Stable Isotopes in Ecology and Environmental

SYLLABUS

Hrs	Frontal teaching
2	Schedule and aim of the course, review of basic ecology.
4	Introduction to marine ecology: features of marine environments, plankton, benthos and nekton.
4	Primary production: photosynthesis and chemosynthesis; classification criteria, growth and spatio-temporal distribution of phytoplankton; mechanisms of control; limiting factors.
4	Decomposition: origin, size and chemical composition of detritus; decomposition phases; mechanisms of control; role of environmental factors; microbial network; organisms feeding on detritus.
6	Food webs: metrics; trophic cascades. Methods to study food webs: stomach content analysis; stable isotope analysis; fatty acid analysis. Food preferences and trophic strategies of fishes.
6	Deep-sea: environmental features; benthic communities; biota adaptations; food webs; ecological role; pressures. Hydrothermal vents, cold seeps, whale and wood falls.
4	Polar ecosystems: environmental features; biota adaptations; primary production; food webs; comparison between Arctic and Antarctic oceans; pressures.
4	Disturbance: definition; natural and anthropic disturbance; acute and chronic disturbance; recovery and resilience of marine ecosystems; ecological role of disturbance.
6	Global change: definition, causes and effects on marine ecosystems; feedbacks in the ocean. Ocean acidification and ecological effects.
Hrs	Practice
6	Exercises on: decomposition rates, food webs, community structure
4	Exercises on: measurements of seawater chemico/physical variables, sampling of abiotic and biotic samples
2	Exercises in conference call with scuba divers on benthos sampling techniques