COURSE OF STUDY: Science and Management of Maritime Activities
ACADEMIC YEAR: *2024/2025*
ACADEMIC SUBJECT: Ecology

General information	
Year of the course	third year
Academic calendar (starting and ending date)	October,02 2024 – January 16, 2025
Credits (CFU/ETCS):	9
SSD	BIO07
Language	Italian
Mode of attendance	non mandatory attendance

Professor/ Lecturer	
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Department and address	Dept. of Biosciences, Biotechnologies and Environment – via Orabona, 4 - 70125
Virtual room	piattaforma TEAMS – codice 56yls3w
Office Hours (and modalities: e.g., by appointment, on line, etc.)	Wednesday and Thursday, 2pm - 3pm other days and times agreed by e-mail messages

Work schedule			
Hours			
Total	Lectures	Hands-on (laboratory, workshops, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
225	*64*	*15*	*146*
CFU/ETCS			
9	*8*	*1*	*9*

Learning Objectives	The acquisition of a systemic conception of the environment; it will be able to predict possible effects due to environmental and/or anthropic variations and finally to evaluate the environmental quality, understand the variations over time, also as a function of disturbance events.
Course prerequisites	Basic knowledge related to scientific subjects such as mathematics, physics and general chemistry.

Teaching strategie	The frontal lesson takes place in the classroom with the aid of multimedia supports. A strong teacher-student interaction is foreseen which will be stimulated by the teacher during the lesson.
Expected learning outcomes in terms of	
Knowledge and understanding on:	Acquire basic knowledge on the functioning, above all, of the marine ecosystem and understand its variations over time, also as a function of disturbance events. This knowledge together with the ability to understand, also useful for dissemination and educational purposes, will be acquired through lectures and exercises.
Applying knowledge and	Acquire the methodology necessary for the application of knowledge and

understanding on:	understanding of the basic principles of ecology. During the teaching activities, the student will be invited to compare the different interpretative proposals relating to the specific topics presented in the programme.

Soft skills	• *Making informed judgments and choices*
	  ○ The acquisition and development of the critical study capacity on the ecology indicated in the teaching program, also through the critical study of the most significant literature on the individual subjects under study by means of didactic activities of a seminar type.
	• *Communicating knowledge and understanding*
	  ○ The acquisition of the ability to argue on the fundamental principles of ecology, to be able to communicate well and argue in moments of sharing and discussion in the classroom, both individually and in groups.
	• *Capacities to continue learning*
	  ○ The acquisition of the methodology necessary for learning, the mastery of the discipline, the critical study of the main concepts of ecology, of the most significant literature existing on the subjects studied in the program carried out.

Syllabus	
Content knowledge	ECOSYSTEM ECOLOGY *Ecology introduction*. Ecosystem concept. Stability of environmental systems: (resistance and resilience). *Ecosystem*. Components and factors. Energetics of ecosystems. Productivity concept. Productivity in the aquatic and terrestrial environment. Food chains, trophic webs and trophic levels. Ecological pyramids. Biological magnification. *Environmental matrices*. Atmosphere (composition and structure, precipitation, wind, climate). Hydrosphere (water resources, main water compartments). *Biogeochemical cycles*. Hydrological cycle. Carbon cycle. Greenhouse effect and climate change. Nitrogen cycle. Eutrophication. Dry and wet acid depositions. MARINE BIOLOGICAL RESOURCES General concept of resource. Renewable and non-renewable resources. The biological marine resources and their distribution Organisms of plankton, benthos and necton: general characteristics. Methodologies and tools for research in marine biology. Sampling of marine organisms: plankton, benthos and necton. Fisheries science. Assessment and management of biological resources exploited by fishing activity
Texts and readings	▪ Appunti di ecologia e spunti di sostenibilità. G. D'Onghia libreriauniversitaria.it, 186 pgg. ▪ Elementi di Ecologia. T. M. Smith - R.L. Smith - Pearson Ed., 9/Ed.., Ediz. italiana a cura di A. Occhipinti, G. Badino, M. Cantonati.
Notes, additional materials	The recommended texts must be supplemented by documents available in electronic format. The use of lecture notes is strongly recommended.
Repository	The recommended texts can also be consulted at the library of the Department of Biosciences, Biotechnology and the Environment.

Assessment	
Assessment methods	The verification will consist in the administration of a multiple-choice questionnaire. Each candidate will have to answer 30 questions randomly selected from the SISDA program (computer system of teaching support) "questionnaire option". The evaluation of the verification is expressed in thirtieths and will be carried out twice, at the end of November and at the end

	of January.
Assessment criteria	• *Knowledge and understanding* At the end of the course the student will have acquired a systemic conception of the environment. Being able to predict possible effects due to environmental and anthropic variations, in order to be able to evaluate the environmental quality of a site thanks to the use of analytical descriptors. *Applying knowledge and understanding* After acquiring individual notions provided during the course, the student will be able to demonstrate the ability to integrate knowledge on the individual components of the marine environment with a holistic perspective. Knowledge of the notions alone will be evaluated no more than an average level. *Autonomy of judgment* The acquisition of the ability to argue on the fundamental principles of ecology, to acquire autonomy in moments of discussion both individually and in groups. *Communicating knowledge and understanding* The demonstration of knowing how to evaluate and interpret experimental data, case studies and trends in ecological models is indicative of the full maturity of the preparation. • *Communication skills* Knowing how to communicate the contents of ecology in a clear and scientifically correct way is considered fundamental for the positive outcome of the examination. Capacities to continue learning. • *Capacities to continue learning* The ability to transfer marine ecology content and formulate interpretations with clarity and correct terminology is essential for decision makers and will be highly valued.
Final exam and grading criteria	The final grade is assigned out of thirty. The exam takes place in oral form and is passed when the vote is greater than or equal to 18. To achieve a high evaluation, the student must have developed independent judgment and adequate argumentation and exposition skills. If these requirements are met, an honors score will be awarded.
Further information	
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