

**ACADEMIC YEAR 2025/2026**

<b>General information</b>	
Name of the integrated course	<b>GENERAL AND APPLIED BIOLOGY</b>
Integrated teaching modules	<b>General Biology and Zoology; Marine Plant Biology.</b>
Degree course	Science of Marine Productions and Resources (L38)
Academic Year	I year
European Credit Transfer and Accumulation System (ECTS)	11
Language	Italian
Period of teaching	I semester
Attendance	Not mandatory, recommended

<b>Teacher</b>	<b>e-mail address</b>	<b>phone</b>
Caterina Longo	caterina.longo@uniba.it	+39 080 5443357
Bottalico Antonella	antonella.bottalico@uniba.it	+39 080 5442163

Headquarters	Taranto presso Ex II Facoltà di Scienze MM.FF.NN, Via Alcide de Gasperi, (Quartiere Paolo VI) - 74123 Taranto
Virtual rooms	Microsoft Teams code: cxgg0mc ( <b>GENERAL BIOLOGY AND ZOOLOGY</b> ); 10noflh ( <b>MARINE PLANT BIOLOGY</b> )
Tutoring (time and day)	Prof. Longo C. From Monday to Friday from 11:30 to 13:30 exclusively by appointment via email  Prof. Bottalico A. From Monday to Friday from 11:30 to 13:30 exclusively by appointment via email

<b>Syllabus</b>	
<b>Learning Objectives</b>	<p><b>GENERAL BIOLOGY AND ZOOLOGY</b></p> <p>The course aims to provide students with the basic knowledge of animal biology and marine zoology starting from the concepts of general zoology (animal cytology; fundamental elements of reproductive and developmental biology) up to the anatomical, morphological and functional description of the main animal phyla necessary for the specific and permanent professional training in the field of marine productions.</p> <p>The course also provides the tools for the taxonomic identification and description of the main marine animal taxa of interest in the breeding of edible and inedible marine species.</p> <p><b>MARINE PLANT BIOLOGY</b></p> <p>The course aims to introduce to the knowledge of the main plant groups of the marine environment (algae and plants) and of their biology and ecology; to provide tools for the identification of the main marine plant organisms with particular reference to the most common and/or important of the Mediterranean Sea.</p>
<b>Course prerequisites</b>	Basic knowledge of animal biology and general botany acquired at secondary level studies will facilitate the understanding of many covered topics.

<p><b>Contents of the teaching module:</b> <b>GENERAL BIOLOGY AND ZOOLOGY</b></p> <p><b>Teacher:</b> <b>Prof. Caterina Longo</b></p> <p><b>Lectures</b> <b>ECTS:</b> <b>6</b></p> <p><b>Hours:</b>  <b>48</b></p>	<p><b>Introduction</b> Characteristics of living organisms. Division into Kingdoms. Definition of animal.</p> <p><b>Fundamental principles of animal life</b> The animal cell: evolution, organization and functioning. Mitosis and meiosis.</p> <p><b>Reproduction and development</b> Asexual and sexual reproduction. Hermaphroditism and gonocorism, sex determination. Amphigonia and parthenogenesis. General features of embryonic development. Levels of animal organization: protostomes and deuterostomes, diblastic and triblastic, symmetry, metamery and body cavity.</p> <p><b>Fundaments of morphology and comparative physiology</b> The integument. Skeletal systems. The movement. Breathing, circulation. Nutrition and digestion. Nervous system and sense organs.</p> <p><b>Taxonomy and structural plans of animals</b> Nomenclature and classification of animals. The animal architecture and bauplan.</p> <p><b>Overview of the main marine animal phyla</b> Generalities, characteristics and phylogeny of the main marine animal phyla: Porifera, Cnidarians, Molluscs, Annelids, Arthropods (Crustaceans), Echinoderms, Chordates (Urochordates, Cephalochordates and marine Vertebrates).</p>
<p><b>Contents of the teaching module:</b> <b>MARINE PLANT BIOLOGY</b></p> <p><b>Teacher:</b> <b>Prof. Antonella Bottalico</b></p> <p><b>Lectures</b> <b>ECTS:</b> <b>5</b></p> <p><b>Hours:</b> <b>40</b></p>	<p>Aquatic organisms: algae and phanerogams. Definition and general characters. Systematic criteria and phylogenesis of algae. Review of the main algal Divisions: morphological, biological, and ecological characteristics. Characteristics of marine Angiosperms with particular reference to morphology, biology and ecological importance of the species occurring in the Mediterranean Sea. A brief overview of structure and functions of marine plant communities.</p>

<p><b>Biosafety rules for the attendance of practical activities.</b></p>	
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<b>Material for the personal study</b>	
<b>Books and bibliography</b>	<p>MODULE <b>GENERAL BIOLOGY AND ZOOLOGY</b></p> <p>AT THE STUDENT'S CHOICE BETWEEN:</p> <ul style="list-style-type: none"> <li>• De Bernardi et al. (2012). Zoologia. Parte Generale. (Idelson-Gnocchi Ed.)</li> <li>• Candia et al. (2016). Zoologia. Parte Sistematica. (Idelson-Gnocchi Ed.)</li> </ul> <p>Or</p> <ul style="list-style-type: none"> <li>• Hickman et al. (2020). Fondamenti di zoologia. (McGraw-Hill Ed.)</li> <li>• Hickman et al. (2020). Diversità animale. (McGraw-Hill Ed.)</li> </ul> <p>MODULE <b>MARINE PLANT BIOLOGY</b></p> <p>G. Pasqua, G. Abate &amp; C. Forni. Botanica generale e diversità vegetale. V edizione. Padova: Piccin Nuova Libreria (in press).</p>
<b>Additional materials</b>	<p>During the course students will be provided with further bibliographical references as well as slides, scientific articles and links to marine zoological and botanical web sites.</p>

<b>Work schedule</b>			
<b>Hours</b>			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Individual study
275	88		187
<b>ECTS</b>			
11	11		

<b>Teaching strategy</b>	
	Lectures by means of PowerPoint presentations.

<b>Expected learning outcomes</b>	
<b>Knowledge and understanding ability</b>	<p>At the end of the course the student must have acquired the basic knowledge and the fundamental principles of animal life starting from the concepts of general zoology (animal cytology; reproductive and developmental biology) up to the description of the main animal phyla (scientific nomenclature; architectures of the animal phyla; structural, morphological and functional differences of the main marine animal phyla).</p> <p>At the end of the course the student must have known and understood morphological, biological and ecological characteristics of the main groups of marine plant organisms and of plant communities in the marine environment, also in relation to the influence of anthropic impact and climatic fluctuations.</p>
<b>Applied knowledge and understanding ability</b>	<p>At the end of the course the student must have acquired basic zoological skills and competences including tools for the recognition and classification of the main marine animal phyla.</p> <p>At the end of the course the student must have acquired skills and competences about the identification of different groups of marine plant organisms and the understanding of the main functions and adaptations in relation to the</p>

	environment.
<b>Soft skills</b>	<ul style="list-style-type: none"> <li>• <i>Making informed judgments and choices</i> Acquisition of autonomy in the identification and interpretation of methodologically adequate paths to describe the distinctive characteristics of animal and plant phyla treated in the course.</li> <li>• <i>Communicating knowledge and understanding</i> Acquisition of zoological and botanical terminology and nomenclature useful for an effective presentation of the basic concepts of marine plant biology, general zoology and the complexity of animal life; Exchange information and interact with other subjects.</li> <li>• <i>Capacities to continue learning</i> Acquisition of the ability to integrate knowledge through the consultation of scientific publications, texts or further resources with a scientific content; Understand and critically discuss the salient aspects of animal biology and marine zoology and plant biology.</li> </ul>
<b>Summary of the knowledge and competences that the integrated course concurs to let the students acquire (Day One Competences) as scheduled by EAEVE</b>	

<b>Assessment and feedback</b>	
Methods of assessment	<p>The student's evaluation involves a final oral exam. The General and Applied Biology exam includes the assessment of both educational modules: General Biology and Zoology, as well as Marine Plant Biology. Participation in classes and classroom discussions held throughout the course will also be taken into consideration. The exam entails the presentation of marine animal and plant taxa and related zoological and botanical insights, with a specific focus on those relevant to both edible and non-edible marine productions. Further targeted questions concerning the main subject matter from various perspectives and connections to other pertinent themes will allow for the evaluation not only of the acquired knowledge and reasoning abilities of the student but also their skills in communication and solving concrete problems. Expressive capabilities, the use of context-appropriate language, the ability to interlink diverse topics, and the skill of synthesis will all be assessed.</p>
Evaluation criteria	<ul style="list-style-type: none"> <li>• <i>Knowledge and understanding:</i> The student is called to apply the theoretical aspects acquired for the recognition, classification and description of the studied animal and plant phyla also through comparative morphological analyzes of representative models.</li> <li>• <i>Applied knowledge and understanding:</i> The student must be able to apply the theoretical knowledge acquired by demonstrating the ability to recognize the main marine animal and plant taxa studied during the course.</li> </ul>

	<ul style="list-style-type: none"> <li>• <i>Autonomy of judgment:</i> The student must be able to autonomously analyze the acquired knowledge and skills demonstrating his ability to identify the morphological and structural characteristics necessary for the identification and taxonomic classification of the studied marine animal and plant phyla.</li> <li>• <i>Communication skills:</i> The student must have acquired the ability to communicate the concepts learned using correct zoological and botanical terminology and nomenclature, discussing and critically commenting the learned concepts.</li> <li>• <i>Capacities to continue learning:</i> <i>The student must demonstrate that he has acquired the tools to learn the theoretical knowledge of zoology and marine plant biology from university books. The student will also be able to enrich his knowledge through in-depth studies, drawing on specific texts, scientific publications and/or documentaries, or thematic seminars and workshops proposed during the course.</i></li> </ul>
Criteria for assessment and attribution of the final mark	<p>The exam is graded on a scale of thirty. The exam is considered passed with a score not lower than 18/30. Merely possessing factual knowledge of terms and concepts is not sufficient for passing the exam. The outcomes of the educational modules "General Biology and Zoology" and "Marine Plant Biology" contribute to determining the final grade for the General and Applied Biology exam. The final grade for the General and Applied Biology exam is the result of a collective judgment based on the evaluations obtained in the two modules "General Biology and Zoology" and "Marine Plant Biology." Knowledge, clarity, communication skills, acquired competence, and the depth of understanding are essential elements for assigning the exam grade. Honors (cum laude) are awarded in case of highly positive assessment in both modules of the General Biology and Zoology and are decided unanimously by the Exam Committee.</p>
<b>Other comments</b>	