



# UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze della Terra e del Mare		
ACADEMIC YEAR	2016/2017		
BACHELOR'S DEGREE (BSC)	NATURAL AND ENVIRONMENTAL SCIENCES		
INTEGRATED COURSE	ZOOLOGY - INTEGRATED COURSE		
CODE	07744		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	BIO/05		
HEAD PROFESSOR(S)	CAMMARATA MATTEO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	CAMMARATA MATTEO	Professore Ordinario	Univ. di PALERMO
CREDITS	12		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<b>CAMMARATA MATTEO</b> Monday 09:00 11:30 Viale delle Scienze ED 16 Dipartimento della terra e del mare		

**DOCENTE:** Prof. MATTEO CAMMARATA

<b>PREREQUISITES</b>	none
<b>LEARNING OUTCOMES</b>	<p>Knowledge and comprehension</p> <p>Acquisition of theoretical and methodological knowledge in the field of zoology for the understanding of the basic tools of the taxonomy and classification. Knowledge on current and historical causes of species distribution and adaptations. Recognition, through the use of specific systematic keys, of the main species that constitute the Italian fauna.</p> <p>Applying knowledge and comprehension.</p> <p>Ability to use independently the acquired knowledge that are in naturalistic preparation in an evolutionary context. Ability to process biological data to describe the state of the environment depending on the present species.</p> <p>Autonomous thinking.</p> <p>Personal interpretation of the data and an informed assessment of the level of integration of the animal component in natural systems.</p> <p>Communication ability.</p> <p>Ability to present results and the acquired skills with good use of language and to disclose knowledge with scientific strictness. Acquisition of the relational capabilities which are indispensable to collaborate in multidisciplinary studies in the laboratory and in the field.</p> <p>Learning ability</p> <p>Acquired skills to find information from the international zoological literature and to deepen and constantly update the material.</p>
<b>ASSESSMENT METHODS</b>	<p>EXAM: midterm and final 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.</p> <p>EVALUATION CRITERIA</p> <ul style="list-style-type: none"><li>-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;</li><li>- 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;</li><li>- 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;</li><li>- 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;</li><li>- 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;</li><li>- assessment: fail, insufficient knowledge of the topics of the course.</li></ul>
<b>TEACHING METHODS</b>	<p>Frontal lectures and laboratory activity</p> <p>Reading materials and slides of lecture presentations will be provided in course</p>

## MODULE ZOOLOGY 1

*Prof. MATTEO CAMMARATA*

### SUGGESTED BIBLIOGRAPHY

Hickman et al. Fondamenti di Zoologia Ed. Mc GrawHill  
De Bernardi et al Zoologia Parte generale Idelson Gnocchi  
Baccetti et al. Trattato Italiano di Zoologia. Vol. I Ed. Zanichelli

<b>AMBIT</b>	50176-Discipline naturalistiche
<b>INDIVIDUAL STUDY (Hrs)</b>	102
<b>COURSE ACTIVITY (Hrs)</b>	48

### EDUCATIONAL OBJECTIVES OF THE MODULE

Objective of the course is provide students with a comprehensive knowledge of Animal Kingdom biodiversity applying an evolutionary approach.  
The course aims to raise awareness of the theories, the scientific foundations of systematic and phylogeny of animal evolution, the levels of organization and training plans of the major phyla. The course also highlights the body interactions / population environment.

## SYLLABUS

Hrs	Frontal teaching
12	BASIC CONCEPTS OF SYSTEMATIC, PHYLOGENESIS AND EVOLUTION Animal classification, theoretical assumptions and methods. The theories and the scientific basis of evolution. Microevolution. The concept of population and species. the biological basis of the evolution
24	MORPHO-FUNCTIONAL ZOOLOGY General concepts and basic principles of animal life; heterotrophic, motility; reproduction and reproductive strategies. Bauplan and organization levels; symmetry; segmentation; body cavity; musculoskeletal systems. Main functions: nutrition, breathing, bloodstream, excretion, osmoregulation, thermoregulation, support, movement, nervous and endocrine coordination, reception sensory, sexuality and reproduction , development and life cycles. Interactions between organisms: symbiosis, commensalism, parasitism. BEHAVIORAL ZOOLOGY Migration, environmental adaptations, Mimicry. reproductive biology, eco-ethology.
12	Introduction to Systematic Zoology Levels of hierarchical organization of animal complexity, systematic profile. The bauplan of the main phyla and their evolution. Origin and evolution of the main taxa. Principles and methods of classification. Use and Application of morphological and molecular data in the phylogenetic reconstruction.

## MODULE ZOOLOGY 2

*Prof. MATTEO CAMMARATA*

### SUGGESTED BIBLIOGRAPHY

Hickman et al. *Diversita' Animale* Ed. Mc GrawHill  
De Bernardi et al. *Zoologia Parte sistematica* Idelson Gnocchi  
Baccetti et al. *Trattato Italiano di Zoologia*. Vol. II Ed. Zanichelli

<b>AMBIT</b>	50170-Discipline biologiche
<b>INDIVIDUAL STUDY (Hrs)</b>	98
<b>COURSE ACTIVITY (Hrs)</b>	52

### EDUCATIONAL OBJECTIVES OF THE MODULE

According to the "manifesto" of the degree course "Scienze della Natura e dell'ambiente" the final target of the course of general and systematic zoology is to give to students a good knowledge on contents and methods pertaining the necessary tools to the study of zoology on the basis of the previously introduced theories, mechanisms and the scientific basis of animal evolution. Here we provide (i) the theoretical tools of phylogenetic cladistics-classification. Bauplan and organization levels of Protozoa and Metazoa organisms. (iii) Reproduction and reproductive strategies; development and life cycles. Students acquire skills in the use of systematic keys useful for the identification of the main groups of invertebrates and vertebrates.

## SYLLABUS

Hrs	Frontal teaching
2	PROTOZOA
2	PORIFERA
2	CNIDARIANS AND CTENOPHORA
2	ACOELOMATES BILATERIAN METAZOA
2	PSEUDOCLOMATE METAZOAN
3	MOLLUSCS
2	ANELLIDS
3	ARTHROPODS (CHELICERATES, CRUSTACEAN)
3	ARTHROPODS (MIRIAPODA, EXAPODA)
3	OTHER PROTOSTOMES
3	ECHINODERMS. EMICHORDATA
3	CHORDATA (UROCHORDATA, CEPHALOCHORDATA)
10	VERTEBRATES
Hrs	Practice
12	Animal observation and recognition. systematic key use with particular emphasis to Mediterranean fauna