



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2023/2024		
BACHELOR'S DEGREE (BSC)	BIOLOGICAL SCIENCES		
INTEGRATED COURSE	GENERAL AND SYSTEMATIC ZOOLOGY WITH PRACTICE		
CODE	15884		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	BIO/05		
HEAD PROFESSOR(S)	LO BRUTTO SABRINA	Professore Associato	Univ. di PALERMO
	ARIZZA VINCENZO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	LO BRUTTO SABRINA	Professore Associato	Univ. di PALERMO
	ARIZZA VINCENZO	Professore Ordinario	Univ. di PALERMO
	SARA' MAURIZIO	Professore Associato	Univ. di PALERMO
CREDITS	12		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>ARIZZA VINCENZO</p> <p>Monday 9:00 13:00 Studio, Dip. STEBICEF Via Archirafi, 18</p> <p>Tuesday 15:00 17:00 Sede del Consorzio Universitario, corso Vittorio Emanuele, 92, 93100 Caltanissetta</p> <p>Wednesday 9:00 13:00 Studio, Dip. STEBICEF Via Archirafi, 18</p> <p>Thursday 9:00 13:00 Studio, Dip. STEBICEF Via Archirafi, 18</p> <p>Friday 9:00 13:00 Studio, Dip. STEBICEF Via Archirafi, 18</p> <p>LO BRUTTO SABRINA</p> <p>Monday 9:00 13:00 Gli studenti possono fissare un appuntamento in qualsiasi giorno via e-mail scrivendo a sabrina.lobrutto@unipa.it</p> <p>SARA' MAURIZIO</p> <p>Monday 08:00 10:00 Sezione Biologia Animale, Via Archirafi 18 stanza del docente</p> <p>Tuesday 08:00 10:00 Sezione Biologia Animale, Via Archirafi 18 stanza del docente</p> <p>Wednesday 12:00 14:00 Sezione Biologia Animale, Via Archirafi 18 stanza del docente</p>		

DOCENTE: Prof. VINCENZO ARIZZA- *Lettere A-K*

PREREQUISITES	Basic concepts of Chemistry, Physics and Cytology
LEARNING OUTCOMES	Knowledge and understanding Acquisition of theoretical and methodological knowledge in the field of zoology focused on understanding the mechanisms and the current and historical causes of the distribution and adaptations of the species. Recognition, through the use of specific systematic keys, of the main taxa that constitute the Italian fauna. Applying knowledge and understanding Ability to use independently the acquired knowledge to describe the state of the environment depending on the species present. Making judgments Ability to own interpretation of the data and of a conscious evaluation of the level of integrity of the animal component of biological systems. communication skills Ability to present with clarity and propriety of language skills acquired and to disclose with scientific rigor. Acquiring social skills needed to work in multidisciplinary studies in the area. learning ability Acquired ability to find information from the international zoological literature and to deepen and constantly update the material. Ability to undertake scientific and technical preparation and high degree of autonomy of systematic zoological studies more in-depth.
ASSESSMENT METHODS	The exam opens with a topic of choice for the student, a topic to correlate to several other subjects. The student must show autonomy in the conceptual path and synthesis skills while maintaining scientific rigor in describing and linking the contents of General Zoology and Systematics. The program may be subject to one or more in-itinere evaluations, the result of which can be taken into account in the final evaluation. The threshold of sufficiency in the final exam will be reached when the student shows the knowledge and understanding of the arguments, at least in the general lines, of the animal world as a whole, associating morpho-anatomical forms with functions, describing the taxonomic characteristics of the main taxa and using a technical language that is consistent with the course. Evaluation improves the more the student, with its arguing and exhibiting capabilities, interacts with the professor, and the more his knowledge will go into details.
TEACHING METHODS	Lectures and Lab training

PREREQUISITES	Basic knowledge on Chemistry Physics and Biology
LEARNING OUTCOMES	<p>Knowledge and understanding</p> <p>Acquisition of theoretical and methodological knowledge in the field of zoology that enable to understand the mechanisms and the current and historical causes of their 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 understanding.</p> <p>Ability to use the acquired knowledge and process of the faunal data to describe the state of the environment.</p> <p>Making judgments.</p> <p>Ability to develop own interpretation of the data.</p> <p>Communication skills.</p> <p>Ability to discuss with good language skills and scientific rigour.</p> <p>Learning ability.</p> <p>Acquired the ability to find information from the international zoological literature and to deepen and constantly update the material.</p> <p>Ability to undertake scientific and technical preparation and high degree of autonomy further studies of Zoological Systematics.</p>
ASSESSMENT METHODS	<p>The check mode is formulated on the basis of an oral test.</p> <p>The oral test tends to verify the processing capacity and possession of an appropriate visual display mastery of the topics, the properties of language and the ability to apply knowledge and skills to solve problems proposed.</p> <p>The assessment is expressed in the thirtieth and examination will be evaluated according to the following assessment rubric:</p> <ul style="list-style-type: none">- Excellent 30-30 laude: Excellent knowledge of the topics, excellent properties' of language, good analytical ability, the student is able to apply knowledge to solve problems proposed.- Very good 26 - 29: Good mastery of the subjects, full ownership 'of language, the student is able to apply knowledge to solve problems proposed.- Good 24-25: Basic knowledge of the main topics, discrete properties of language, with limited ability to independently apply the knowledge to the solution of the proposed problems.- Satisfactory 21-23: does not have full command of the main teaching subjects but it has the knowledge, satisfactory property language, poor ability to independently apply the knowledge acquired- Sufficient 18-20: minima Basic knowledge of the main arguments put forward by the teaching and the technical language, very little or no ability to independently apply the knowledge acquired- Insufficient <18: does not have an acceptable knowledge of the contents of the topics covered in the teaching
TEACHING METHODS	Lectures and lab. Active learning.

**MODULE
ZOOLOGY II WITH PRACTICE**

Prof. MAURIZIO SARA' - Lettere A-K, - Lettere A-K

SUGGESTED BIBLIOGRAPHY

Hickman et al. ZOOLOGIA Ed. Mc GrawHill ISBN 978-88-386-6743-5
 Per consultazione: Nick Lane le Invenzioni della vita. Ed. il Saggiatore. ISBN 978-884281803-8
 Richard Dawkins Il Gene Egoista, Oscar Mondadori ISBN 978-88-0439318-4

AMBIT	10665-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	98
COURSE ACTIVITY (Hrs)	52

EDUCATIONAL OBJECTIVES OF THE MODULE

The course deals with Systematic Zoology from Protozoans to Vertebrates. Basic knowledge of Darwin's theory, morphology, evolution and systematic of every phylum are provided. Visits to Museum provide basic insight into the main Vertebrate species of Italian fauna.

SYLLABUS

Hrs	Frontal teaching
4	Methods in Taxonomy and Systematics
2	the Protozoans
2	Poriphera (sea-sponges)
2	Cnidaria (Jellyfish, corals, and other stingers) and Ctenophora
3	Ecdysozoa and Lophotrocozoa
3	the Metazoan: Platyhelminthes (flatworms)
2	Nematodes (roundworms) and other Pseudocoelomates Metazoan
4	phylum Mollusca
3	Phylum Anellida and the earthworms
6	phylum Arthropoda
2	Phylum Echinoderms
3	phyla of Chordata
4	the Vertebrates
Hrs	Workshops
12	ACTIVITY to be carried out in the LABORATORY. Study techniques, observation and recognition of sample organisms of the Mediterranean fauna. From data collection to computational analysis

MODULE ZOOLOGY I WITH PRACTICE

Prof. VINCENZO ARIZZA - Lettere A-K, - Lettere A-K

SUGGESTED BIBLIOGRAPHY

- Fondamenti di Zoologia Hickman et al, (18a Ed.). McGraw-Hill. ISBN 95500883
 - Integrated Principles of Zoology 18th Edition SBN10: 1260205193 ISBN13: 9781260205190

AMBIT	50029-Discipline biologiche
INDIVIDUAL STUDY (Hrs)	98
COURSE ACTIVITY (Hrs)	52

EDUCATIONAL OBJECTIVES OF THE MODULE

The course defines the necessary tools to study zoology. It aims to raise awareness of the theories, the scientific basis of animal evolution, the levels of organization and training plans of the major phyla. Also highlights the body interactions / population environment.

SYLLABUS

Hrs	Frontal teaching
2	Life and zoological principles. The origins and chemistry of life
2	Symmetry and skeletal systems
2	Protective systems and movement
2	Respiratory system
2	Circulatory system
2	Nutrition and digestion
2	Osmotic adjustment, excretion.
4	Nervous and chemical coordination
2	Thermoregulation
2	Immune system
2	Basics of animal behavior
2	Animal mimicry
2	Symbiosis
6	Asexual and sexual reproduction, sex determination and reproductive strategies.
6	Comparative study of the development and morphogenesis of reference phyla.
Hrs	Workshops
12	EXERCISE Observation of the morpho-anatomical structures by using a microscope. Use of systematic keys for classification of taxa treated during the course with particular reference to Mediterranean fauna

MODULE ZOOLOGY I WITH PRACTICE

Prof.ssa SABRINA LO BRUTTO - Lettere L-Z, - Lettere L-Z

SUGGESTED BIBLIOGRAPHY

Hickman et al "Zoologia" McGraw & Hill Education ISBN 978-88-386-1538-2 16° Edizione e tutte le precedenti
Wilfried Westheide & Reinhard Rieger "Zoologia sistematica -Filogenesi e diversita' degli animali" Zanichelli ISBN 978-88-08-26350-6

AMBIT	50029-Discipline biologiche
INDIVIDUAL STUDY (Hrs)	98
COURSE ACTIVITY (Hrs)	52

EDUCATIONAL OBJECTIVES OF THE MODULE

The course deals with Systematic Zoology from Protozoans to Vertebrates. Basic knowledge of Evolutionary theory, morphology, evolution and systematic of main phyla.

SYLLABUS

Hrs	Frontal teaching
2	Life and zoological principles. The origins and chemistry of life.
4	The theories and the scientific basis of evolution. Microevolution. The concept of population and animal species. Population genetics and speciation.
2	Evolutionary pressures, changes and environmental stress. The responses of organisms and populations. The diversity of origins of eukaryotes.
2	Symmetry and skeletal systems.
2	Protective systems and movement.
2	Respiratory system
2	Circulatory system.
2	Nutrition and digestion.
2	Osmotic adjustment, excretion
4	Nervous and chemical coordination
2	Animal Bioenergetics
2	Thermoregulation.
2	Basics of animal behavior
2	Animal mimicry. Bioluminescence.
2	Symbiosis. Parasitisms.
4	Asexual and sexual reproduction, sex determination and reproductive strategies.
2	Comparative study of the development and morphogenesis of reference phyla.
Hrs	Workshops
12	Lab

MODULE ZOOLOGY II WITH PRACTICE

Prof.ssa SABRINA LO BRUTTO - Lettere L-Z, - Lettere L-Z

SUGGESTED BIBLIOGRAPHY

- Hickman et al "Zoologia" McGraw & Hill Education ISBN 978-88-386-1538-2 16° Edizione e tutte le precedenti
 - Wilfried Westheide & Reinhard Rieger "Zoologia sistematica -Filogenesi e diversita' degli animali" Zanichelli ISBN 978-88-08-26350-6

Monografie disponibili in Ateneo per la consultazione:

Lepidoptera : Coleophoridae, G.Baldizzone, Edagricole-New Business Media
 Hymenoptera : Symphyta I, F. Pesarini, Edagricole-New Business Media
 Ascidiacea of the European waters, R.Brunetti, Edagricole-New Business Media
 Mammalia IV : Cetacea, L. Cagnolaro, Edagricole-New Business Media
 Marine rotifera, De Smet, Willem H.Calderini
 Porifera I : Calcarea, Demospongiae (partim), Hexactinellida, Homoscleromorpha, M.Pansini, Calderini
 Mammalia V : Chiroptera, B.Lanza, Calderini
 Reptilia, C.Corti, Calderini
 Chaetognata, E.Ghirardelli, Calderini

AMBIT	10665-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	98
COURSE ACTIVITY (Hrs)	52

EDUCATIONAL OBJECTIVES OF THE MODULE

The course deals with Systematic Zoology from Protozoans to Vertebrates. Basic knowledge of Darwin's theory, morphology, evolution and systematics of every phylum is provided. Lab activities provide basic insight into the main species of Italian fauna.

SYLLABUS

Hrs	Frontal teaching
2	Methods in Taxonomy and Systematics
2	The Protozoans
3	Porifera (sea-sponges).
3	Cnidaria (Jellyfish, corals, and other stingers) and Ctenophora.
3	Ecdysozoa and Lophotrochozoa.
3	The Metazoan:Platyhelminthes (flatworms).
2	Nematodes (roundworms) and other Pseudocoelomates Metazoan.
4	Phylum Mollusca
3	Phylum Anellida
6	Phylum Arthropoda.
2	Phylum Echinodermata
3	Phylum Emicordata, Urocordata, Cefalocordata
4	Phylum Chordata. Vertebrates
Hrs	Workshops
12	Lab