



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze della Terra e del Mare		
ACADEMIC YEAR	2023/2024		
MASTER'S DEGREE (MSC)	MARINE BIOLOGY		
SUBJECT	APPLIED MARINE ZOOLOGY		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50506-Discipline del settore biodiversità e ambiente		
CODE	20504		
SCIENTIFIC SECTOR(S)	BIO/05		
HEAD PROFESSOR(S)	ARCULEO MARCO	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	ARCULEO MARCO Monday 13:00 14:30 Stanza del docente, Dipartimento STEBICEF, Via Archirafi 18, I piano Wednesday 11:00 13:00 Stanza del docente, Dipartimento STEBICEF, Via Archirafi 18, I piano Thursday 13:00 14:30 Stanza del docente, Dipartimento STEBICEF, Via Archirafi 18, I piano		

DOCENTE: Prof. MARCO ARCULEO

PREREQUISITES	The student is expected to have basic knowledge of systematic and general Zoology
LEARNING OUTCOMES	Knowledge and comprehension Acquisition of theoretical and experimental skills related to the knowledge of some groups of vertebrate and invertebrate marine animals of commercial interest through the use of dichotomous keys for their identification, their spatial distribution (migration) and the reproductive aspects, and alien species. Acquisition of a specialized scientific language. Applying knowledge and comprehension. Acquisition of application skills to identify the species covered during the course and understand their reproductive cycle, distribution and growth. Autonomous thinking Acquisition of evaluation skills and competences for the identification of the species and their biological cycle. Communication ability Acquisition of adequate skills and tools for communication, with regard to the presentation of the results of zoological studies, communication and dissemination of information on issues concerning the topics of the lessons. 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.
ASSESSMENT METHODS	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 midterm test and the final exam (both as a fraction of 30). For each exam the mark is assigned according to the level of knowledge and understanding of the program topics, the ability to analyze and combine information obtained from the course and the use of an appropriate scientific terminology. 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. Assessment criteria: Excellent (30-30 cum laude). Excellent knowledge of the topics, excellent properties of language, good analytical ability. The student is also able to apply his/her knowledge to solve all proposed problems Very good (26-29). Good mastery of the topics, full property of language. The student is able to apply his/her knowledge to solve proposed problems. Good (24-25). The student reached a basic knowledge of the main topics, discrete properties of language, with limited ability to independently apply the his/her knowledge to the solution of the proposed problems. Satisfactory (21-23). The student does not have full mastery of the main topics of teaching, but it possesses the knowledge, satisfactory property language, poor ability to independently apply the acquired knowledge. Sufficient (18-20). The student has a minimum basic knowledge of the main topics and technical language issues, very little or no ability to independently apply the acquired knowledge. Insufficient - The student does not have an acceptable knowledge of the contents of the topics covered in the course.
EDUCATIONAL OBJECTIVES	The course provides an overview of the main groups of invertebrates and vertebrates marine animals of commercial interest, their taxonomy, adaptations and biology. The student will acquire skills related to the key biological and ecological characteristics of vertebrates and invertebrates as well as the use of systematic keys useful for the identification of the main Mediterranean marine species. It will also be able to critically evaluate the biological-adaptive aspects and changes of animal biodiversity in response to climatic change and alien species
TEACHING METHODS	- Lectures and exercises
SUGGESTED BIBLIOGRAPHY	E. Tortonese 1972 Pesci Ossei vol. X e XI Calderini editore - E. Tortonese 1970 Pesci Cartilaginei vol. II Calderini editore - Fiches FAO Identification Vol I e II - FAO - E. D'Agaro I crostacei Biologia, produzione, patologie e commercializzazione. Aracne Editrice - Articoli su riviste scientifiche internazionali.

SYLLABUS

Hrs	Frontal teaching
2	Elements of morphology and reproductive biology of Hagfish and Lamprey
6	Elements of morphology and reproductive biology of molluscs (gastropods, bivalves and cephalopods)
6	Elements of morphology and reproductive biology of Crustaceans (decapod and stomatopods).
2	Elements of morphology and reproductive biology of echinoderms (Echinoidea).
6	Elements of morphology and reproductive biology of cartilaginous fishes.
6	Elements of morphology and reproductive biology of bony fishes.
3	Elements of morphology and reproductive biology of Chelonians

SYLLABUS

Hrs	Frontal teaching
3	Elements of morphology and reproductive biology of Cetaceans
2	Environmental adaptations and life strategies: migrations
2	Environmental adaptations and life strategies: bathymetric distribution
2	Environmental adaptations and life strategies: biodiversity and alien species.

Hrs	Practice
2	Use of dichotomous keys for the classification of groups of commercial interest: molluscs (gastropods, bivalves and cephalopods)
2	Use of dichotomous keys for the classification of groups of commercial interest: Crustaceans (decapod and stomatopods).
2	Use of dichotomous keys for the classification of groups of commercial interest: echinoderms (Echinoidea).
4	Use of dichotomous keys for the classification of groups of commercial interest: bony and cartilaginous fishes.
2	Use of dichotomous keys for the classification of Mediterranean Chelonians and Cetaceans