ACADEMIC YEAR 2023/2024

General information	
Academic subject	**AQUATIC ANIMALS PHYSIOLOGY AND ENDOCRINOLOGY** (integrated exam of ANATOMY AND PHYSIOLOGY OF FARMED MARINE SPECIES)
Degree course	Science of Marine Productions and Resources (L38)
Academic Year	I year
European Credit Transfer and Accumulation System (ECTS)	6 (5+1)
Language	Italian
Academic calendar (starting and ending date)	II semester
Attendance	Not mandatory

Professor/ Lecturer	
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Virtual headquarters	Microsoft Teams
Tutoring (time and day)	Tuesday- Thursday 10.00-12.00 am; Monday and Wednesday 3.00-5.00 pm or by appointment

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Syllabus	
Learning Objectives	The course aims at transferring technical and in-depth knowledge of the functional mechanisms of the organs and systems of marine acquatic animals. Students must learn basic knowledge of endocrinology together with the understanding of the physiological mechanisms underlying intercellular communication and the activity of the whole marine animal organism by means of chemical messengers. Students will have to undertake a comparative study of the endocrinology of the different animal species in line with the educational objectives of the degree course.
Course prerequisites	Students must have taken and passed the exam of the General and Applied Biology, Biochemistry exams. They should have acquired therefore knowledge about the mechanisms that regulate cell function as well as the features and classifications of aquatic animals.
Contents	Sense organs: sight, hearing, touch and smell, orientation systems and adaptations to marine life. Osmoregulation. Movement in water, floating and swimming. Aquatic breathing. Blood and cardio-circulatory system in marine vertebrates and invertebrates. Kidneys and excretory system. Digestion. Species differences: bony and cartilaginous fish, bivalve molluscs, cephalopods, crustaceans, echinoderms. The endocrine system. Hypothalamus and pituitary, urophysis, epiphysis, thyroid and parathyroids, pancreas, interrenal tissue and adrenal glands. Gonads and reproduction. Regulation of body temperature, species-specific adaptations.
Books and bibliography	Fisiologia degli animali marini- Poli, Fabbri (Edises)
Additional materials	Lecture notes and scientific papers are recommended

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study

			hours
Hours			
150	***50***	***10***	***90***
ECTS			
6	***5***	*1*	

Teaching strategy	
	Lessons will take place in the classroom, using the support of a projector, and will be presented as PowerPoint slideshow. The teacher will provide students with scientific works to supplement the knowledge available in the recommended textbook. The course will be completed by a series of laboratory exercises through which students will put into practice some basic knowledge previously learned.
Expected learning outcomes	
Knowledge and understanding on:	Students should acquire the basic knowledge of the functioning mechanisms of the organs and systems of marine aquatic animals. Students will also acquire essential knowledge of endocrinology; they will understand that intercellular communication is regulated in its entirety by the nervous and endocrine. At the end of the course students will be able to functionally relate the various endocrine glands and systems.
Applying knowledge and understanding on:	○ Communicate effectively with clients, the public, professional colleagues and responsible authorities, using language appropriate to the audience concerned and in full respect of confidentiality and privacy. ○ Work effectively as a member of a multi-disciplinary team in the delivery of services. ○ Be able to review and evaluate literature and presentations critically. ○ Demonstrate an ability of lifelong learning and a commitment to learning and professional development. This includes recording and reflecting on professional experience and taking measures to improve performance and competence. ○ Assess the physical condition, welfare and nutritional status of an animal or group of animals and advise the client on principles of husbandry and feeding. ○ Assess and manage pain. ○ Advise on, and implement, preventive and eradication programmes appropriate to the species and in line with accepted animal health, welfare and public health standards.
Soft skills	**Making informed judgments and choices** ○ At the end of the course, students must be able to evaluate the mechanisms regulating organs and systems and to express their opinions about the cause/effect processes underlying the different functioning of the organs of marine aquatic animals. **Communicating knowledge and understanding** ○ Students must acquire the correct scientific skills and technical language to provide specialist professional support. **Capacities to continue learning** ○ Students must acquire the ability to improve their knowledge independently through further studies by reading specialized texts and scientific literature, as well as through specialist courses.

Assessment and feedback	
Methods of assessment	At the end of the course, students in good standing with prerequisites will be

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	admitted to the final examination. The exam will consist of an interview or a written test with multiple-choice questions on the topics of the course. Students must demonstrate technical and in-depth knowledge of several topics of the course program, using scientific terminology and showing critical skills in analysing the functioning of the organs of aquatic animals.
Evaluation criteria	The examination commission will take into account: - Knowledge and understanding (**scores from 1 to 8**): • Students are expected to organize the knowledge of the basic and fundamental concepts of the program course and show the ability to analyse the principles of functioning of organs and apparatuses - Applying knowledge and understanding (**scores from 1 to 8**): o Students are expected to demonstrate their knowledge about the methodologies for evaluating the physiological parameters of marine aquatic species. o Ability to connect all the notions learned and report specific topics. - Autonomy of judgment (**scores from 1 to 8**): o Students are expected to propose critical hypotheses on the causes and factors affecting the functioning mechanisms of the organs and systems of marine aquatic animals. - Communicating knowledge and understanding (**scores from 1 to 3**): o Students are expected to critically and independently discuss the issues addressed in the course program. o Students are expected to discuss the program topics with appropriate scientific and technical language. - Capacities to understanding (**scores from 1 to 3**): o Students are expected to make connections between the different topics of the course program.
Criteria for assessment and attribution of the final mark	The assessment of students' knowledge will be carried out through an oral interview. The final mark will be the result of the collegial judgment relating to the partial tests in which the student must demonstrate to have acquired a critical sense of the topics studied. The final mark is expressed out of thirty. The exam will be passed with a mark equal to or greater than 18 and will take into consideration not only the accuracy of the answer, but also the communication skills, clarity of presentation, disciplinary competence and the level of detail.
Additional information	

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