

**ACADEMIC YEAR 2023/2024**

| <b>General information</b>                              |   |
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| Academic subject  | <b>VETERINARY PHYSIOLOGY 2</b>  |
| Integrated teaching modules                             | <b>Veterinary Physiology 2;<br/>Veterinary Endocrinology;<br/>Veterinary Bioethics.</b> |
| Degree course   | Single cycle degree in Veterinary Medicine (LM42)                                       |
| Academic Year   | II  |
| European Credit Transfer and Accumulation System (ECTS) | 11 (lectures: 9 ECTS; ECTS exe/lab/tutor: 2)  |
| Language  | VET/02  |
| Academic calendar (starting and ending date)            | Italian   |
| Attendance  | II 7 weeks period   |
| Academic subject  | Mandatory   |

| <b>Teacher</b>       | <b>indirizzo mail</b>         | <b>telefono</b> |
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| Angelo Quaranta      | angelo.quaranta@uniba.it      | 0805443927      |
| Marcello Siniscalchi | marcello.siniscalchi@uniba.it | 0805443927      |
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| Michele Indelicato   | michele.indelicato@uniba.it   | 0805714532      |

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| Department and address  | Campus of Veterinary Medicine, S.P. 62Casamassima km 3, Valenzano                       |
| Virtual headquarters    | Microsoft Teams   |
| Tutoring (time and day) | Tuesday- Thursday 10.00-12.00 am<br>Monday and Wednesday 3.00-5.00 pm or by appointment |

| <b>Syllabus</b>             |  |
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| <b>Learning Objectives</b>  | The course aims in transferring technical and in-depth knowledge of the functional mechanisms of the organs and systems of domestic animals. The student must learn basic concepts of endocrinology together with the understanding of the physiological mechanisms underlying intercellular communication and the activity of the whole organism by means of chemical messengers. The student 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. The students must acquire the principles underlying an ethical reasoning so that they can apply it in all fields of the profession of Veterinarian. |
| <b>Course prerequisites</b> | Physiology 1. Students should have acquired therefore knowledge about the mechanisms that regulate cell function the central and peripheral nervous system.  |

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| <p>Contents:<br/><b>Veterinary Physiology 2</b></p> <p>Teachers:<br/><b>Angelo QUARANTA<br/>Marcello SINISCALCHI</b></p> <p><b>Lectures<br/>CFU: 4</b></p> <p><b>Hours: 40</b></p> <p><b>Hands on (Laboratory, working groups, seminars, field trips)</b></p> <p><b>CFU: 1</b></p> <p><b>Hours: 15</b></p> | <p>The course concerns Basic Sciences<br/><b>FUNDAMENTAL SCIENCE: PHYSIOLOGY OF THE CARDIO-CIRCULATORY SYSTEM.</b><br/>The heart as a pump. Cardiac output. Cardiac electrophysiology and electrocardiography. Blood vessels and blood pressure. Special Circulations.</p> <p><b>PHYSIOLOGY OF BREATHING.</b><br/>Ventilation and gas exchange. Transport of O<sub>2</sub> and CO<sub>2</sub>. Breathing regulation. Breathing in birds.</p> <p><b>PHYSIOLOGY OF THE KIDNEYS AND URINARY TRACT.</b><br/>Renal circulation and glomerular filtration. Tubular function. Adjusting the volume and osmolarity of body fluids. Acid-base regulation. Urinary tract and urination. Principles of physical and chemical examination of urine.</p> <p><b>PHYSIOLOGY OF DIGESTION.</b><br/>Oral cavity. Pharynx and esophagus. Stomach. Liver and pancreas. Small and large intestine. Forestomachs and rumination. Digestion in birds.</p> <p>External manifestations of cardiac activity. Heart sounds. Measurement and evaluation of heart sounds. Electrocardiogram Principles and applications. Blood pressure. Evaluation and calculation of respiratory rate. Influence of breath types. Principles of the physio-chemical examination of urine: physiological parameters and factors that influence their variations. Glandular secretion of the stomach. Mechanisms of secretion and their functions. Digestive physiology of forestomachs and rumination.</p> |
| <p>Contents:<br/>Veterinary Endocrinology</p> <p>Lecturer:<br/><b>Maria ALBRIZIO</b></p> <p><b>Lectures<br/>CFU: 3</b></p> <p><b>Hours: 30</b></p>   | <p>The module concerns Basic Sciences<br/><b>INTRODUCTION TO THE ENDOCRINE SYSTEM</b><br/>Glands and hormones (chemical nature, synthesis, storage and transport, interaction with target cells, regulation of secretion)</p> <p><b>HORMONAL DOSAGE</b><br/>RIA and ELISA methods.</p> <p><b>HYPOTHALAMIC-PITUITARY SYSTEM</b><br/>Portal system, hypothalamic factors, hormones of the adenohypophysis and neurohypophysis.</p> <p><b>ADRENAL GLAND</b><br/>cortical and medulla regions.</p> <p><b>ENDOCRINE PANCREAS</b><br/>Insulin, glucagon, somatostatin, pancreatic polypeptide.</p>  |

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| <p><b>Hands on (Laboratory, working groups, seminars, field trips)</b></p> <p><b>CFU: 1</b></p> <p><b>Hours: 15</b></p>   | <p><b>HORMONES PRODUCED IN THE DIGESTIVE TRACT</b><br/>Gastrin, secretin, cholecystokinin, gastric inhibitory peptide</p> <p><b>ENDOCRINE REGULATION OF CALCIUM AND PHOSPHATE METABOLISM</b><br/>Parathyroid hormone, vitamin D and calcitonin.</p> <p><b>THYROID</b><br/>Metabolic and physiological actions of thyroid hormones</p> <p><b>ENDOCRINE MODULATION OF METABOLISM</b><br/>orexigenic and anorexigenic peptides</p> <p><b>HORMONES PRODUCED BY NON-ENDOCRINE STRUCTURES</b><br/>Myokines, Adipokines, renin, natriuretic peptides, erythropoietin</p> <p><b>ENDOCRINE REGULATION OF REPRODUCTION</b><br/>Gonadotropin, melatonin, estrogens, progesterone, placental lactogen, relaxin, prostaglandin, testosterone, inhibin</p> <p><b>MAMMARY GLAND AND LACTATION.</b></p> <p>Hormonal dosages<br/>Monitoring of the estrous cycle: vaginal cytology and rapid progesterone dosage<br/>Blood glucose monitoring</p> |
| <p><b>Contents:</b><br/><b>Veterinary Bioethics</b></p> <p><b>Lecturer:</b><br/><b>Michele INDELLICATO</b></p> <p><b>Lectures</b><br/><b>CFU: 2</b></p> <p><b>Hours: 16</b></p> | <p>Characteristics of the human-animal relationship and its evolution<br/>European and national legislation<br/>Well-being and conditions of well-being among animal species<br/>Ethics and European Regulation 1/2005<br/>Human-animal relationship<br/>pets, livestock, wild animals, animals used in shows, hunting animals and fishing animals<br/>Ethics and European Regulation 1099/2009<br/>Indicators of well-being, regulations and new legislative proposals<br/>Ethics and Italian and European legislation in force<br/>Presentation of theoretical and practical aspects<br/>Presentation of the case history of the species.</p>  |
| <p><b>Hands on activities</b></p>   | <p>The practical activities will be held in the afternoon during the two-month period of teaching according to the schedule reported in the lesson diary.<br/>Students will be divided into groups of 5-8 students and the individual activities will be replicated for each of the groups. The number of groups is related to the type of practical activity and the consistency of the cohort of students attending the course.</p>  |
| <p><b>Biosecurity measures</b></p>  | <p>Students must wear protective clothing (white coat and gloves) and have read the biosecurity manual.</p>  |

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| <b>Books and study materials</b> |   |
| <b>Books and bibliography</b>    | Sjaastad, Sand, Hove, "Fisiologia degli animali domestici", Casa Editrice Ambrosiana, 2013.<br>Battaglia L., Un'etica per il mondo vivente. Questioni di bioetica medica, ambientale, animale, Carocci, Roma 2011 |
| <b>Additional materials</b>      | Lecture notes and scientific papers are recommended   |

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| <b>Work schedule</b> |          |  |   |
| <b>Hours</b>         |          |  |   |
| Total                | Lectures | Hands on (Laboratory, working groups, seminars, field trips) | Out-of-class study hours/<br>Self-study hours |
| 275                  | 86       | 30   | 159   |
| <b>CFU/ETCS</b>      |          |  |   |
| 11                   | 9        | 2  | /   |

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| <b>Teaching strategy</b> | <p>Lectures will take place in the classroom, using the support of a projector, and will be presented as PowerPoint slideshow. During the course, self-assessment questionnaires are provided to verify the learning status. 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 learned.</p> <p>The practical lessons will take place at the Labdog laboratory of the Section of Animal Physiology and Behavior of the Department of Veterinary Medicine for the direct measurement of the physiological parameters for the clinical evaluations of domestic animals.</p> <p>The exercises of the Veterinary Endocrinology module will be carried out in the "Cellular and molecular biology" and "Endorphin-mediated pathologies" laboratories. Students will participate in the exercises divided into small groups flanked by the teacher and laboratory staff. In addition, halfway through the course, the teacher will divide the students into groups and assign each one a topic to be explored. The result of the work must be organized in a presentation in power point format that each group will present to the class. The teacher will formulate an opinion on the learners regarding their ability to deepen a topic, to divide the work and to present the results.</p> |
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| <b>Expected learning outcomes</b>      |   |
| <b>Knowledge and understanding on:</b> | <p>Students should acquire the basic knowledge of the functioning mechanisms of the organs and systems of domestic animals.</p> <p>The student will also acquire essential knowledge of endocrinology; will understand that intercellular communication is regulated in its entirety by the nervous, endocrine, and immune systems and that the division of these systems is merely theoretical, since they share many similar characteristics in the functional regulation of the organism. At the end of the course the student will be able to functionally relate the various endocrine glands and to evaluate the main hormonal alterations of an animal organism.</p> <p>Basic knowledge of the factors that modulate these mechanisms:</p> |

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|  | <ul style="list-style-type: none"> <li>• DOC 2.1 Understanding of, and competence in, the logical approaches to both scientific and clinical reasoning, the distinction between the two, and the strengths and limitations of each.</li> <li>• DOC 2.2 Research methods, the contribution of basic and applied research to veterinary science and implementation of 3Rs (Replacement, Reduction, Refinement).</li> <li>• DOC 2.3 The structure, function and behavior of animals and their physiological and welfare needs.</li> <li>• DOC 2.12 The ethical framework within which veterinary surgeons should work, including important ethical theories that inform decision-making in professional and animal welfare related ethics.</li> </ul>   |
| <p><b>Applying knowledge and understanding on:</b></p> | <ul style="list-style-type: none"> <li>○ DOC 1.4 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.</li> <li>○ DOC 1.6 Work effectively as a member of a multi-disciplinary team in the delivery of services.</li> <li>○ DOC 1.8 Be able to review and evaluate literature and presentations critically.</li> <li>○ DOC 1.9 Understand and apply principles of clinical governance, and practice evidence-based veterinary medicine</li> <li>○ DOC 1.13 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.</li> <li>○ DOC 1.20 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.</li> <li>○ DOC 1.31 Assess and manage pain.</li> <li>○ DOC 1.36 Advise on, and implement, preventive and eradication programs appropriate to the species and in line with accepted animal health, welfare and public health standards.</li> </ul>  |
| <p><b>Soft skills</b></p>                              | <ul style="list-style-type: none"> <li>• Making informed judgments and choices             <ul style="list-style-type: none"> <li>○ At the end of the course, students must be able to evaluate the meaning of specific animal behaviors and to express their opinions about the cause / effect processes underlying the different functioning of the organs of domestic animals</li> <li>○ Students are also expected to acquire the following soft skills: Must also acquire the following cross-cutting competence: DOC 2.3 The structure, function and behavior of animals and their physiological and welfare needs.</li> </ul> </li> <li>• Communicating knowledge and understanding             <ul style="list-style-type: none"> <li>○ Students must acquire the correct scientific skills and technical language to provide specialist professional support.</li> <li>○ Students are also expected to acquire the following soft skills: DOC 2.1 Understanding of, and competence in, the logical approaches to both scientific and clinical reasoning, the distinction between the two, and the strengths and limitations of each.</li> </ul> </li> <li>• Capacities to continue learning             <ul style="list-style-type: none"> <li>○ Students must acquire the ability to improve their knowledge independently through further studies by reading specialized texts and</li> </ul> </li> </ul> |

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|                           | <p>scientific literature, as well as through courses and by the direct observation of animals.</p> <ul style="list-style-type: none"> <li>○ Students are also expected to acquire the following soft skills: DOC 2.2 Research methods, the contribution of basic and applied research to veterinary science and implementation of 3Rs (Replacement, Reduction, Refinement).</li> </ul> |
| <b>Day One Competence</b> | <p><b>Knowledge and understanding:</b></p> <p>2.1<br/>2.2<br/>2.3<br/>2.12</p> <p><b>Applying knowledge and understanding:</b></p> <p>1.4<br/>1.6<br/>1.8<br/>1.9<br/>1.13<br/>1.20<br/>1.31<br/>1.36</p>  |

| <b>Assessment and feedback</b> |  |
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| Methods of assessment          | <p>At the end of the course, students in good standing with prerequisites will be 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.</p> <p>Students must demonstrate technical and in-depth knowledge of several topics of the course program, using scientific terminology and showing critical skills in analyzing the functioning of the organs of domestic animals.</p>   |
| Evaluation criteria            | <p>In formulating the judgment for each student, the teacher will take into account:</p> <ul style="list-style-type: none"> <li>● <b>Knowledge and understanding (scores from 1 to 8):</b> <ul style="list-style-type: none"> <li>○ Students are expected to organize the knowledge of the basic and fundamental concepts of the program course and show the ability to analyze the principles of functioning of organs and apparatuses, which are crucial for the study and the understanding of pathological processes.</li> </ul> </li> <li>● <b>Applying knowledge and understanding (scores from 1 to 8):</b> <ul style="list-style-type: none"> <li>○ Students are expected to demonstrate their knowledge about the methodologies for evaluating the physiological parameters of domestic species.</li> <li>○ Ability to connect all the notions learned and report on a specific topic</li> <li>○ Ability to independently read and interpret a report relating to the concentration of hormones in biological samples</li> <li>○ Adequate application of bioethical principles</li> </ul> </li> <li>● <b>Autonomy of judgment (scores from 1 to 8):</b> <ul style="list-style-type: none"> <li>○ Students are expected to propose critical hypotheses on the causes and factors affecting the functioning mechanisms of the organs and systems of domestic animals</li> <li>○ Critical analysis of ethical problems inherent in the veterinary profession.</li> </ul> </li> <li>● <b>Communicating knowledge and understanding (scores from 1 to 3):</b></li> </ul> |



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|   | <ul style="list-style-type: none"><li>○ Students are expected to critically and independently discuss the issues addressed in the course program</li><li>○ Ability to interact with colleagues in the division of work, in the preparation of the power point and in the presentation of group work assigned by the teacher during the course.</li><li>○ Students are expected to make connections between the different topics of the course program</li><li>○ Students are expected to discuss the program topics with appropriate scientific and technical language</li><li>● Capacities to continue learning (<b>scores from 1 to 3</b>):<ul style="list-style-type: none"><li>○ Students are expected to show the ability to improve their knowledge independently through the reading of specialized texts and scientific literature.</li><li>○ Students will have acquired an adequate study method that allows him to continue the study independently</li></ul></li></ul> |
| Criteria for assessment and attribution of the final mark | The assessment of students' knowledge will be carried out through an oral exam. The final grade 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 grade is expressed out of thirty. The exam will be passed with a grade 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.  |
| <b>Additional information</b>                             |  |