

Course Unit	Physiology	Field of study	Biology and Biochemistry
Bachelor in	Veterinary Nursing	School	School of Agriculture
Academic Year	2022/2023	Year of study	1
Type	Semestral	Semester	1
Level	1-1	ECTS credits	6.0
Code	9085-671-1104-00-22		
Workload (hours)	162	Contact hours	T 30 TP - PL 22 TC 3 S 5 E - OT 20 O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Susana Claudia Gomes Alves, Teresa Maria Montenegro Araújo A. Correia

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. To understand the physiological function of the "animal machine" in its different aspects, in mammals, birds, reptiles and fish. Differences, advantages and disadvantages among the species considered.
2. Understanding and intervention in order to alleviate the heat stress on animals.

### Prerequisites

Before the course unit the learner is expected to be able to:

1. Knowledge of anatomy.
2. Knowledge of biochemistry.
3. Knowledge of physiology

### Course contents

The blood its components and functions. Circulatory system. The lymphatic system. Respiratory system (mammals and birds) . Digestive system (monogastric, polygastric and birds). Urinary system. Mammary gland and biosynthesis of milk. Heat stress.

### Course contents (extended version)

1. Blood
  - Blood cells, plasma and electrolytes
  - Blood groups of companion animals and others
  - Blood clotting
  - Anemia types and diagnostic methods. Myelogram
2. Cardiovascular system
  - Dimension, shape and function of the heart in mammals, birds and fish.
  - General properties of cardiac muscle. Cardiac cycle and heart sounds. Cardiac output.
  - Blood veins and microcirculation. Lymphatic system. Pressure flow regulation
  - Factors that regulate blood output: hormones, vascular resistance and extrinsic regulation
  - Electrocardiogram, P, QRS, T and U waves. Derivations
  - Cardiac dysfunction: hypertension, fibrillation, tachycardic and heart block
3. Respiratory system
  - The airways. Structure and function of lungs in several species.
  - Mechanic of respiration. the respiratory muscles. Respiration types. Transportation and gas exchanges
  - Nervous and chemical regulation of respiration
  - Study methods, auscultations and registration intrapleural pressure
4. Urinary system
  - Structure and function of the kidney. The nephron as functional unit.
  - Filtration, tubular reabsorption and tubular excretion.
  - Renal circulation. Nervous and hormonal control of renal function.
  - Mechanisms of urine concentration. composition and urine output. Clearance and tubular threshold.
  - Glomerulonephritis, cystitis, nephrotic syndrome and other kidney infections.
5. Physiology of the mammary gland.
  - Structure of the mammary gland in different animal species. Mammary gland development.
  - Biosynthesis and storage of milk. Ejection of milk. Colostrum, composition and functions.
  - Mastitis, and cancer.
6. Practical part
  - Presentation of a work on the nervous system
  - Hemolysis of red blood cells. Determination of blood compatibility.
  - Blood coagulation. CBC. Heart rate, arterial pulse and blood pressure.
  - Cardiac auscultation.
  - Chemical and physical analysis of urine.
  - Introduction to Echocardiography
  - Different parts of a neurological exam.

### Recommended reading

1. HILL, R. W. , WYSE, G. A. , ANDERSON, M. , 2012. Animal Physiology. 3ª Edição, Sinaver, EUA.
2. HARVEY, J. W. , 2012. Veterinary Hematology. A Diagnostic guide Color Atlas. University of Florida, FL, EUA.
3. MOYES, d. ; SCHULTE, M. P. , 2016. Principals of Animal Physiology. Pearson Education. India
4. REECE, W. et al. 2015. Dukes' Physiology of Domestic Animals. 13ª edição, Wiley-Blackwell, NY, EUA.
5. SWENSON, D. V. M. , MELVIN, J. , 1984. Fisiologia dos Animais Domésticos. Guanabara, Rio de Janeiro, Brasil.

### Teaching and learning methods

Teaching of theoretical and practical instruction, including practice in laboratory and field. Encouraging the continued study and deeper on the subjects offered in lecture classes. Resources: audiovisual, multimedia, computer, online library, laboratory equipment, live animals in the ESAB and dead animals from the slaughterhouse.

### Assessment methods

1. Conti. : 70% (R. exam+Restrit Exam. ) 30% P. Work - (Regular, Student Worker) (Final, Supplementary)

**Assessment methods**

- Intermediate Written Test - 50% (Minimum score of 8. 0 values.)
  - Final Written Exam - 50% (Minimum score of 9. 5 values.)
  - Practical Work - 30% (Minimum score of 9. 5 values.)
2. Resource 100% (T/P). Minimum score 9,5 - (Regular, Student Worker) (Final, Supplementary, Special)

**Language of instruction**

1. Portuguese
2. Spanish

**Electronic validation**

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14-12-2022	19-12-2022	19-12-2022	19-12-2022