INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Animal histophysiology			Field of study	Biology and biochemistry		
Bachelor in	Biology and Biotechnology			School	School of Agriculture		
Academic Year	2022/2023	Year of study	1	Level	1-1	ECTS credits	6.0
Type	Semestral	Semester	2	Code	9029-510-1204-00-22		

Workload (hours)	162	Contact hours	T	TP	PL	TC	S	E	OT	O
			30	-	30	-	-	-	4	-

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): Sandra Sofia Quinteiro Rodrigues, 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. Recognize and distinguish the main characteristics of different tissues and relate their histology with its functionality.
2. Describe the different organ structure and relate them to their functionality and their integration into different systems.
3. It also intended that the student apprehends that both tissues such as organs or systems function as a whole, in a homeostasis system, coordinated by nervous system and endocrine system.
4. Skill in the manipulation of tissues, organ and systems, proper use of all equipment to carry out histological sections. Distinguish between a healthy tissue and a modified one.

Prerequisites

Before the course unit the learner is expected to be able to:
1. Knowledge of biology.
2. Knowledge of physiology

Course contents

Main characteristic of epithelium and glands, will be mentioned. Connective and supportive tissues which included the adipose, cartilage and bone tissues. Blood. Three types of muscle tissue are identified according to their structure, contractility and control mechanisms. Nervous and endocrine systems. Cardiovascular, respiratory, digestive, urinary and reproductive systems will be addressed. Carry out histological sections, staining and microscopic observation.

Course contents (extended version)

1. Epithelium classification. introduction and definitation.
   - Squamous, cuboidal, columnar and transitional.
   - Simple, stratified, peseudostratified. Specialization: microvilli, cilia and estenocilia.
   - Neuroepithelial cells.
   - Mioepithelial cells
   - Exocrine and endocrine glands. Tape of secretor product.
2. Connective tissue. Definitivos and function.
   - Classification of matrix. Extracellular matrix and fibres.
   - Connective tissue, no specialized, loose connective, and specialised. Adipose, cartilage and bone.
   - Cells of Connective tissue.
3. Blood.
   - Plasma.
   - Elementos of the blood.
   - Haematopoiesis, after and before birth.
   - Immune system.
4. Cardiovascular system.
   - Different blood vessels. Relation between structure and fuction. Sensores receptores. Cardiac cycle.
   - Endocardium, miocardium, pericardium. Heart blood vessels, lymph blood vessels and innervations.
   - Lymphatic vessels structure and function.
5. Muscular systeam.
   - Smooth muscle. Microscópico struture. Contactos, miogenesis, hypertrophy and regeneration.
   - Skeletal muscle. Classification. Contraction, miogenesis, hypertrophy, atrophy and regeneration.
6. Nervous system.
   - Different types of neurons and their function. Neuronal sinapsis. Neuroglia.
   - Peripheral nervous system. Nerves, ganglia and efferent terminations and receptors.
   - Central nervous system. Cerebral cortex, cerebellar cortex, spinal cord and cerebrospinal fluid.
7. Endocrine system. principal endocrine glands.
   - Adenohyphysis and neurohyphysis.
   - Pineal gland. structure and function.
   - Thyroid gland. Structure and function.
   - Parathyroid gland. Struture and function.
   - Adrenal gland. Córtex and medulla. Structure and function.
   - Endocrine pancreas. Pancreatic islets. Structure and function.
8. Respiratory system.
   - Nasal cavity. Olfactory organ, vomeronasal organ and paranasal sinues.
   - Nasopharynx
   - Larynx
   - Trachea
   - Lungs. Bronchioles, alvéolos e pleura. Pulmonary circulatory system.
9. Digestive systeam.
   - Oral cavity. special strutures and teeth. Salivary glands. Pharynx. Oesophagus.
   - Monogastric stomach. Glandular and no Glandular region. Differents between species.
   - Ruminant stomach. rumen, reticulum, omasum and abomasum.
   - Small intestine.
   - Large intestine.
   - Liver and gallblader.
   - Avian digestive systeam.
10. Urinary systeam. kidney, overall organization and differences between species.
    - Renal corpuscles
    - Tubules: proximal e distal, convoluted, straight and collecting.
    - Vascularisation
    - Juxtaglomerular apparatus
    - . Urinary tract
    - Histophysiology.
11. Male reprodutive system.

Course contents (extended version)

- Testes. Túnicas. Intertitial cells. Seminiferous tubules. Epididymids. Canal deferens.
- Spermatogenesis.
- Acessory glands. Prostate. Bulbouretral gland.
- Urethra
- Penis. Corpora cavernosa, penis glands and prepurce. mechanism of erection.

12. Female reprodutive systeam
    - Ovary. Different types of follicles and follicular waves. intersticial endocrine cells.
    - Uterine tube. Vessels and nerves. Histophysiology.
    - Uterus. Endométrio, Myometrium, Perimetrium. Cyclic modifications, vessels and nerves. Cérvix.
    - Vagina. struture histological. Cyclic modifications. Vestibule, Clitoris and vulva.
    - Avian female reprodutive system. Ovary, oviduct, vagina and cloaca.
13. Practical part
    - Observation microscope slides of different tissues.
    - Different stages in the development of histological section.
    - Study visit.

Recommended reading

1. DAHLGREN, U. G. and KEPNER, W. A. , (2017). A text book of the Principales of Animal Histology. Andesite Press. USA
2. CUNNINGHAM, J. G. , (2004). Tratado de Fisiologia Veterinária. Terceira Edição. Guanabara KooGan. Michigan.
3. ATLAS DE HISTOLOGIA VETERINÁRIA (virtual). Universidade Federal Fluminense. http: //www. uff. br/atlashistovet/
4. HOSSNER, K. L. , (2005). Hormonal Regulation of Farm Animal Growth. CABI Publishing. London U. K.
5. DELLMANN, D. , H e EURELL, (1998). Veterinary Histology. Williams &Wilkins, 5th edition.

Teaching and learning methods

Theoretical lessons on fundamental concepts with complemented illustrative examples. Practical classes with guided by experimental protocols that include preparation and microscopic observation of histological slides. Theoretical component is performed by two written examination. Practical component is performed by practical examination and some preparation-working group presented orally.

Assessment methods

1. Continuous evaluation - (Regular, Student Worker) (Final)
    - Intermediate Written Test - 35% (Minimum score of 8. 0 values.)
    - Final Written Exam - 35% (Minimum score of 8. 0 values.)
    - Practical Work - 30%
2. Exam with theoretical and pratica (100%l) - (Regular, Student Worker) (Final, Supplementary, Special)

Language of instruction

Portuguese

Electronic validation

Sandra Sofia Quinteiro Rodrigues, Teresa Maria Montenegro Araújo A. Correia	Rui Miguel Vaz de Abreu	Altino Branco Choupina	Paula Cristina Azevedo Rodrigues
21-12-2022	23-12-2022	25-12-2022	26-12-2022