

ANATOMY AND ANIMAL PHYSIOLOGY for the specialization Biotechnologies (YEAR I, SECOND SEMESTER)

Credit value (ECTS) 4

Course category: optional

Course holder

Associate Professor Dr. Mircea LAZ R

Discipline objectives (course and practical works)

Theoretical and practical training of students to assimilate knowledge, through systematized information on the phenomena of functional integration, anatomical orientation, from cell to body.

As specific objectives, the discipline of Animal Anatomy and Physiology, in accordance with the analytical program, aims to:

- knowledge and understanding of notions of anatomy;
- acquiring knowledge on the development of physiological mechanisms that define and involve the apparatus and systems of the animal body.

Content (syllabus)

| Course (chapters / subchapters) |
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| Anatomy and physiology of the cell: anatomy and physiology of the prokaryotic and eukaryotic cell. |
| Bone system anatomy and joints: skeletal systematization, arthrology. |
| Anatomy and physiology of the muscular system: striated, smooth, cardiac muscles and their appendages. |
| Anatomy and physiology of the somatic and vegetative nervous system: synaptic transmission, physiology of the sensory and motor systems. |
| Anatomy and physiology of the endocrine system: hormonal secretion, regulatory mechanisms of the endocrine system, endocrine glands and their physiological role |
| Anatomy and physiology of the internal environment: compartments, composition, hydroelectrolytic homeostasis. Blood and lymph; physiology of the figurative elements (red blood cells, leukocytes, platelets, physiological hemostasis). |
| Anatomy and physiology of the cardiovascular system: properties of the heart muscle, heart revolution. Vascular physiology: blood pressure, venous, capillary and lymphatic circulation. |
| Anatomy and physiology of the digestive system: the anatomical structure of the digestive tract and adnexal glands. Oral, gastric, intestinal digestion; absorption of food principles; regulation of digestive functions. Liver physiology. |
| Metabolism: types of metabolic reactions - general. |
| Respiratory system: the anatomical structure of the respiratory system. Stages of respiration (ventilation, pulmonary hemostasis, blood transport of respiratory gases, cellular respiration); breathing regulation. |
| Anatomy and physiology of the urogenital system: urinary organs, male and female genitals. |

Practical work

The structure of biological membranes. Membrane transport. Resting potential. Potential for action. Orientation plans.

Anatomical terminology. Anatomical exploration methods. Anatomy of the locomotor system: skeleton, joints

Anatomy of the locomotor system:

Muscles

Latent addition phenomenon (summation)

Recording and analysis of simple contraction (muscle shake)

Compound contraction of striated muscle

Applied virtual physiology:

- Highlighting the phases of simple contraction
- The influence of low temperature on the excitability and contractility of striated muscle
- Compound contraction of striated muscle
- The role of the motor plate in the installation of muscle fatigue
- Resting potential
- Potential for action

Nervous system: external conformation of the spinal cord, spinal nerve, applied anatomy of the spinal cord, innervation of the trunk and limbs, applied anatomy of the peripheral nerves.

Conduction of nerve influx through nerve fibers. The law of the propagation of excitation through the nerve fiber.

The law of polar excitation.

Applied virtual physiology:

- Demonstration of the effect of anesthetic substances and low temperature on nerve influx
- Determining the speed of nerve influx and its relationship with the diameter of the nerve fiber and the presence or absence of myelin sheath.

Nervous system: external conformation of the brain, cranial nerves, applied anatomy of the brain and cranial nerves.

The receptive field of the reflex. Determination of reflex time according to the Turk method. Successive summation of arousal in the spinal cord. Reflex arc analysis. Physiology of spinal nerve roots. Bell-Magendie Law. Study of the complex reflex arc in the frog. The laws of medullary reflexes (Pflüger's laws). Tonic reflexes

Anatomy and physiology of the endocrine system: Endocrine glands

Applied virtual physiology:

- Effect of thyroxine, TSH and propylthiouracil on metabolic rate in normal, thyroidectomised and hypophysectomized rats.
- Effect of insulin and alloxane on blood glucose in rats

Anatomy and physiology of the digestive system: oral cavity, salivary glands, pharynx, esophagus, stomach, small intestine, large intestine, liver, pancreas.

Oral digestion. The role of saliva in digestion. Gastric juice. Stomach motility in the frog. Gall bladder and bile.

Anatomy and physiology of the cardiovascular system: heart, anatomy of the heart and large vessels, vascularization of the trunk and limbs, applied anatomy of blood vessels.

Blood collection in animals; serum and blood plasma; ESR; hematocrit; osmotic resistance of erythrocytes. Blood red blood cell counts. Determination of hemoglobin content in the blood. Leukocyte count in the blood. Leukocyte formula. Plasma proteins (fibrinogen, albumin, globulins). Blood groups. Cardiac automatism. Stannius' ligatures. Excitation of the vagus nerve (X) in the frog. Blood pressure. Arterial pulse. Elasticity of arteries. Capillary circulation.

Anatomy and physiology of the respiratory system. Pneumografie. spirometry

Anatomy and physiology of the reproductive system in both sexes:

- Testis, prostate, spermatic pathways, penis;
- The ovary, uterus, vagina, vulva.

Bibliography

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2. **CONSTANTIN N.** i colab, *Fiziologia animalelor domestice*, Editura Coral Sanivet, Bucure ti, 1998
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Final evaluation

| Type of evaluation | Methods of evaluation | Percentage of the final grade |
|--|-----------------------------------|-------------------------------|
| Examination | Written examination | 70% |
| Assessment of the activity during the semester | Verification tests, oral practice | 30% |

Contact person

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