



UNIVERSITY "ISMAIL QEMALI" VLORE
FACULTY OF TECHNICAL SCIENCES
DEPARTMENT OF BIOLOGY

BIO 365 COURSE PROGRAM

Head/Teacher of the subject:	MSc. Xhuljana Arapaj Lectures 3 hours / Seminars 1 hour / Laboratory 1 hour
Charge:	Disciplines of the characteristic formation of the program
Subject typology:	
Academic year/semester when it takes place:	2022 - 2023/ Fall 2023
Subject type:	Mandatory
Study program:	Bachelor in Biology
Subject code:	Bio 365
E-mail address of the holder/pedagogue:	xhuljana.arapaj@univlora.edu.al

SUMMARY AND LEARNING OUTCOMES:

Physiology of animal life is an experimental science and its laboratory experience is an important part of its learning. This book is designed for students of Biology, who will gain a lot of knowledge about the diversity and complexity of life. Physiology of animal organisms analyzes in detail all physiological processes in animals adapted differently to environmental conditions. During the text, the characteristics of the regulatory systems of living things are also analyzed, and at the same time, a detailed explanation is given from both the anatomical and the functional point of view of regulating the mechanisms of action of hormones. The Animal Physiology course aims to provide biology students with basic knowledge about the physiological anatomy of the nervous system, the mechanics of muscle contraction, general concepts for endocrinology, and the construction and functions of the vital organs of animal organisms.

BASIC CONCEPTS:

- 1 Homeostasis**
- 2 Muscle contraction**
- 3 Nervous system**
- 4 Sensory Organs**
- 5 Endocrinology**
- 6 Blood and heart**
- 7 Digestive, Respiratory, Excretory, etc. Apparatus**

COURSE TOPICS:

Topics to be covered in the lectures:

- Topic 1** Internal environment and Homeostasis. The nerve cell and its functions. Resting membrane potential. Action potential. Action potential propagation.
- Topic 2** Biochemistry and mechanics of muscle contraction. The energy source of muscle contraction and the mechanism of muscle contraction. Transmission of impulse from one cell to another. Postsynaptic cell activation and chemical neurotransmitters.

- Physiological anatomy of the nervous system. Its main parts, function and hierarchy of brain floors.
- Topic 3** Motor functions of the nervous system. The motor functions of the spinal cord and the reflexes controlled by it. Motor functions of the brainstem and cortex.
- Motor functions of the basal ganglia. Small brain. Vestibular sensation and balance maintenance.
- Topic 4** Autonomic Nervous System (ANS). Anatomical organization of the SNA and hormonal transmission. Hypothalamus functions in vegetative activity. The limbic system.
- General concepts of sensory physiology. Classification of receptors. Electrical and ionic phenomena at the level of receptors. Adaptation of receptors. Processing of somatovisceral sensory information in the central nervous system.
- Topic 5** Somatosensory functions of the brainstem. The thalamus. Control of somatosensory afferent information. Mechanoreception. The firsts. Physiological anatomy of the eye. Information processing in the central visual system.
- The listening system. Construction of the ear. Propagation of sounds in the cochlear apparatus.
- Topic 7** Stimulation of auditory receptor cells. Central auditory system. Chemical sensitivity, taste and smell.
- General concepts for endocrinology. Classification of hormones. Synthesis and release of hormones.
- Topic 8** Transport and distribution of hormones. Mechanism of action of hormones. Mechanism of action of hormones.
- Hypothalamic-Pituitary System. Adenohypophysis and Neurohypophysis. Endocrine functions of the thyroid gland. Thyroid hormones.
- Topic 9** Functions of thyroid hormones and regulation of their hormone secretion. Endocrine pancreas and its functions. Metabolic actions of insulin. Glucagon and its functions. Adrenocortical hormones and the action of Aldosterone in the kidney.
- Topic 10** Regulation of Aldosterone secretion. Function of Glucocorticoids. Reproduction and hormonal regulation. Male reproductive function. Female reproductive function.
- Hormonal regulation of the ovarian cycle. Fertilization and burden. Childbirth and lactation. The blood. Blood functions. General characteristics and its physicochemical properties. Constituent elements of blood and blood groups.
- Topic 12** The heart and its functions. The structure of the heart. Law of the heart (Starling's Law). Innervation of the heart. Some anatomical and biophysical characteristics of blood vessels. Arteries. Capillaries, veins and lymphatic vessels.
- Topic 13** Hemostasis as a protective mechanism that avoids blood loss. Immunity.
- Topic 14** Breathing. Organization of the respiratory system. Transport of gases by blood. Digestion and

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- Topic 3** Motor functions of the nervous system. The motor functions of the spinal cord and the reflexes controlled by it. Motor functions of the brainstem and cortex.
- Motor functions of the basal ganglia. Small brain. Vestibular sensation and balance maintenance.
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- General concepts of sensory physiology. Classification of receptors. Electrical and ionic phenomena at the level of receptors. Adaptation of receptors. Processing of somatovisceral sensory information in the central nervous system.
- Topic 5**

- Somatosensory functions of the brainstem. The thalamus. Control of somatosensory afferent information. Mechanoreception. The firsts. Physiological anatomy of the eye. Information processing in the central visual system.
- Topic 6** The listening system. Construction of the ear. Propagation of sounds in the cochlear apparatus. Stimulation of auditory receptor cells. Central auditory system. Chemical sensitivity, taste and smell.
- Topic 7** General concepts for endocrinology. Classification of hormones. Synthesis and release of hormones. Transport and distribution of hormones. Mechanism of action of hormones. Mechanism of action of hormones.
- Topic 8** Hypothalamic-Pituitary System. Adenohypophysis and Neurohypophysis. Endocrine functions of the thyroid gland. Thyroid hormones. Functions of thyroid hormones and regulation of their hormone secretion. Endocrine pancreas and its functions. Metabolic actions of insulin. Glucagon and its functions. Adrenocortical hormones and the action of Aldosterone in the kidney.
- Topic 9** Regulation of Aldosterone secretion. Function of Glucocorticoids. Reproduction and hormonal regulation. Male reproductive function. Female reproductive function. Hormonal regulation of the ovarian cycle. Fertilization and burden. Childbirth and lactation. The blood.
- Topic 10** Blood functions. General characteristics and its physicochemical properties. Constituent elements of blood and blood groups.
- Topic 11** The heart and its functions. The structure of the heart. Law of the heart (Starling's Law). Innervation of the heart. Some anatomical and biophysical characteristics of blood vessels. Arteries. Capillaries, veins and lymphatic vessels.
- Topic 12** Hemostasis as a protective mechanism that avoids blood loss.
- Topic 13** Breathing. Organization of the respiratory system. Transport of gases by blood. Digestion and
- Topic 14**
- Topic 15**

Topics that will be covered in other obligations related to the course: laboratory work, practices, course assignments, etc.:

- Topic 1** Somatic sensitivity.
- Topic 2** Somatic sensitivity.
- Topic 3** Neuromuscular reflexes.
- Topic 4** Neuromuscular reflexes.
- Topic 5** Measurement of blood pressure and pulse frequency.
- Topic 6** Red blood cell count.
- Topic 7** Red blood cell count.
- Topic 8** First: visual evidence.
- Topic 9** Counting of white blood cells (Leukocytes).
- Topic 10** Counting of white blood cells (Leukocytes).
- Topic 11** Determination of blood groups.
- Topic 12** Determination of blood groups.
- Topic 13** Measurement of lung function: Spirometry.
- Topic 14** Nutrient assessment.
- Topic 15** Assessment of basal metabolic rate (BMR) and body components.

FORM OF KNOWLEDGE CONTROL

control	Percentage assessment
Control I	25%
Annual assessment: Seminars, laboratories	15% (10% /5%)
Final check	60%

Grading is based on the conversion of the total grade to %, grade 5-10 progressively 41-100%.

Grading	4	5	6	7	8	9	10
ASSESSMENT	-40	41-50	51-60	61-70	71-80	81-90	91-100

ATTENDANCE:

The student, who results in less than 75% attendance for the period that belongs to each partial exam, the period for which he will be tested, will not be included in the relevant exam, will be evaluated with M.

LITERATURE

a)Mandatory basic literature:

1. "Physiology of animal organisms" Prof. Dr. Ethem Ruka

b) Recommended literature:

1. "Guide to the laboratory work of animal physiology" Prof. Asc Valbona Aliko, Tirana 2006.
2. "Basics of Physiology" Luljeta Çakërri, Tirana 2009.

Lecturer

MSc. Xhuljana Arapaj

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