

Course Unit	Anatomophysiology II	Field of study	Expertise Sciences
Bachelor in	Biomedical Laboratory Sciences	School	School of Health
Academic Year	2022/2023	Year of study	1
Type	Semestral	Semester	2
Workload (hours)	135	Contact hours	T - , TP 52, PL - , TC - , S - , E - , OT 8, O -
Level	1-1	ECTS credits	5.0
Code	9995-550-1202-00-22		

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) Nuno Miguel da Cruz Neves

### Learning outcomes and competences

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

1. Describe the localization of urinary organs and the mechanism of renal function.
2. Describe the localization of male reproductive organs and explain the functions of every organ on reproduction.
3. Describe the localization of female reproductive organs, explain the functions of every organ on reproduction and physiologic events during sexual cycle.
4. Describe the localization aspects of endocrine system constituents setting relations with nervous system through the hypothalamus-hypophysis system.
5. Describe macroscopic organization of nervous system and as well as the physiologic events of neural cell communication.

### Prerequisites

Before the course unit the learner is expected to be able to:  
Knowledges about cell structure and organization.

### Course contents

"Urinary System: anatomical aspects, renal function". - "Male Reproductive System: anatomy and functions of the structures". - "Female Reproductive System: anatomy and functions of structures, sexual cycle". - "Endocrine System: anatomical aspects of constituents, chemical mediators effects". - "Neurology: microscopic and macroscopic organization, neurophysiology, levels of integration and senses organs".

### Course contents (extended version)

1. URINARY SYSTEM
  - Structure and localization of the kidney, ureter and urinary bladder.
  - Uriniferous tubule.
  - Renal corpuscle. Filtration barrier. Glomerular filtration rate.
  - Reabsorption and secretion of solutes and water.
  - Regulation of acid-base balance and body fluid osmolality and volume.
2. MALE REPRODUCTIVE SYSTEM
  - Perineum and urogenital triangle.
  - Testes, epididymis, ductus deferens, seminal vesicles, ejaculatory ducts, prostate.
  - Male urethra.
  - Physiological aspects: spermatogenesis, maturation and capacitation of spermatozoa.
  - Seminal and prostatic fluid. Semen.
3. FEMALE REPRODUCTIVE SYSTEM
  - Perineum and urogenital triangle. Female urethra.
  - Anatomical and histological aspects: ovary, uterine tubes, uterus and vagina.
  - Oogenesis. Sexual cycle. Fertilization.
4. ABDOMINAL AND PELVIC CAVITIES
  - Anatomical aspects Peritoneum.
5. ENDOCRINOLOGY
  - Homeostasis. Chemical mediators.
  - Endocrine, neuro-endocrine, neurocrine, intracrine and paracrine functions.
  - Chemical mediators actions on target cell.
  - The 2nd messenger. Hypothalamus-hypophysis system. Hormones from adenohypophysis.
  - Neuro-hormones from neurohypophysis. Hypothalamus and pituitary function.
  - Effects resulting from those mediators actions. Metabolic endocrinology.
  - The role of liver on glycidic, lipidic and protein metabolism.
  - Hormones of pancreatic islets. Insulin and Glucagon. Regulation of plasmatic glucose.
  - Muscle, liver and adipose tissues, the principal target organs of these hormones actions.
  - Thyroid gland. Synthesis of thyroid hormones and their effects on metabolism.
6. ENDOCRINOLOGY (continuation)
  - Endocrine regulation of calcium and phosphate metabolism. Bone dynamics.
  - Parathyroid hormone. Calcitonin. Vitamin D. Adrenal cortex hormones.
  - Mineralocorticoids: effect of aldosterone on regulation of arterial tension.
  - Glicocorticoids: effects of cortisol on metabolisms. Endocrine functions of gonads.
  - Hypothalamus – Hypophysis - Gonad axis.
  - Hormonal variation during sexual cycle, pregnancy and lactation.
7. NERVOUS SYSTEM
  - Neurophysiology. Resting membrane potencial. Action potencial
  - Chemical Synapses
  - Anatomical aspects of the central nervous system. Sinal cord and brain.
  - Sensory system. Sensory receptors. Afferents neurons. Somatosensory cortex.
  - Somatosensory pathways related to pain
  - Somatomotor cortex. Corticospinal tract. Efferents neurons.
8. NERVOUS SYSTEM (continuation)
  - . Autonomic nervous system: sympathetic and parasympathetic.
  - Parasympathetic ganglia and sympathetic ganglia. Neurotransmitters and receptors.
  - Effects of sympathetic and parasympathetic stimulation. Adrenal medulla and sympathetic system.
  - Auditory and vestibular systems. Anatomy of the ear. Auditory physiology. Vestibular physiology
  - Visual System. Structure of the eye. Physiology of the light absortion by the eye.
  - Cranial and spinal nerves

### Recommended reading

1. Drake R. L. , Vogl A. W. , & Mitchell A. W. M. (Eds. ). (2010). Gray's Anatomia para Estudantes (2ª ed. ): Rio de Janeiro: Editora Elsevier.
2. Netter F. H. (Ed. ). (1987). Anatomia y Fisiologia. Colección CIBA de Ilustraciones Médicas. : Barcelona: Salvat Editores.

**Recommended reading**

3. Junqueira, L. C. , & Carneiro, J. (Eds. ). (1999). Histologia Básica (9ª ed. ): Rio de Janeiro: Guanabara Koogan.
4. Berne, R. M. , & Levy, M. N. (Eds. ), (2004). Fisiologia. (5ª ed. ): Rio de Janeiro: Mosby.
5. Haines, D. E. (Ed. ). (2006). Neurociência Fundamental. (3ª ed. ): Rio de Janeiro: Churchill Livingstone Elsevier.

**Teaching and learning methods**

Theoretical-practical lessons are brief expositions of study subject followed by interaction between groups of pupils aiming answers for proposal questions based on images. The individual work of the pupil is guided with resource at practical questions about study subject.

**Assessment methods**

1. Alternative 1 - (Regular, Student Worker) (Final)
  - Intermediate Written Test - 50%
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2. Alternative 2 - (Regular, Student Worker) (Final)
  - Final Written Exam - 100%
3. Alternative 3 - (Regular, Student Worker) (Supplementary)
  - Final Written Exam - 100%
4. Alternative 4 - (Regular, Student Worker) (Special)
  - Final Written Exam - 100%

**Language of instruction**

Portuguese

**Electronic validation**

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08-03-2023	08-03-2023	08-03-2023	08-03-2023