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| Course Unit | Anatomohistofisiology II | | Field of study | Biology and Biochemistry | |
| Bachelor in | Pharmacy | | School | School of Health | |
| Academic Year | 2021/2022 | Year of study | 1 | Level | 1-1 |
| Type | Semestral | Semester | 2 | ECTS credits | 5.0 |
| Code | 9549-644-1201-00-21 | | | | |
| Workload (hours) | 135 | Contact hours | T - | TP 52 | PL - |
| | | | TC - | S - | E - |
| | | | OT 8 | 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) 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 and histologic aspects of urinary organs and the mechanism of renal function.
2. Describe the localization and histologic aspects of male reproductive organs and explain the functions of every organ on reproduction.
3. Describe the localization and histologic aspects of female reproductive organs, explain the functions of every organ on reproduction and physiologic events during sexual cycle.
4. Describe the localization and histologic aspects of endocrine system constituents setting relations with nervous system.
5. Describe macroscopic and microscopic organization of nervous system and 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 and histologic aspects, renal function". - "Male Reproductive System: anatomy histology and functions of the structures". - "Female Reproductive System: anatomy histology and functions of structures, sexual cycle". - "Endocrine System: anatomical and histological 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
 - Anatomical and histological aspects.
 - Structure and localization of the kidney, ureter and urinary bladder.
 - Histology of renal tissue. Uriniferous tubule.
 - Renal corpuscle. Filtration barrier.
 - Physiology of renal tissue. 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.
 - Anatomical and histological aspects: structure and localization of 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.
 - Anatomical and histological aspects: ovary, uterine tubes, uterus and vagina.
 - Female urethra. Physiological aspects: 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)
 - Effects on growth, maturation and development of different systems.
 - 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.
 - Glucocorticoids: effects of cortisol on metabolisms. Endocrine functions of gonads.
 - Hypothalamus – Hypophysis - Gonad axis.
 - Hormonal variation during sexual cycle, pregnancy and lactation.
7. NERVOUS SYSTEM
 - Neuron and Neuroglia. Neurophysiology. Resting membrane potential. Action potential
 - Chemical Synapses
 - Anatomical aspects of the central nervous system. Spinal cord and brain.
 - Sensory system. Sensory receptors. Afferent neurons. Somatosensory cortex.
 - Somatosensory pathways related to pain
 - Somatomotor cortex. Corticospinal tract. Efferent 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 absorption 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.
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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|---------------------------|---------------------------------|----------------------------------|---------------------------------------|
| Nuno Miguel da Cruz Neves | Maria Cristina Martins Teixeira | Ana Maria Nunes Português Galvão | Adília Maria Pires da Silva Fernandes |
| 01-03-2022 | 03-03-2022 | 03-03-2022 | 03-03-2022 |