

BASI MORFOLOGICHE E FUNZIONALI DELLA VITA (IBS003)

Integrated Course (Teaching)

1. language

Italian Language

2. course contents

Coordinator: Prof. STEFANO BOFFELLI

Year Course: First year

Semester: II Semester

UFC: 8

Modules and lecturers:

- ANATOMIA UMANA (IBS023) - 4 ufc - ssd BIO/16

Prof. Paolo Michele Bianchi

- FISIOLOGIA UMANA (IBS024) - 3 ufc - ssd BIO/09

Prof. Stefano Boffelli

- ISTOLOGIA (IBS022) - 1 ufc - ssd BIO/17

Prof. Paola Cesaro

3. BIBLIOGRAPHY

Mandatory Bibliography:

- Modulo di Anatomia Umana e di Fisiologia Umana: Martini FH, Nath JL. Fondamenti di Anatomia e Fisiologia. Edises Editore, 2010*
- Modulo di Istologia: Di Pietro R. Elementi di Istologia. Edises Editore, 2012*

Recommended Bibliography:

- Modulo di Anatomia Umana. A cura di Doletti E. Atlante di Anatomia Umana. Piccin Editore, 2014

4. LEARNING OBJECTIVES

Description of the specific educational objectives of the teaching, according to the 5 Dublin Descriptors:

Knowledge and understanding (Dublino 1)

- Know and understand the physiological processes in the different ages of life and the social, cultural, environmental factors, that affect health and well-being of people in community.*
- Know and understand principal determinants of health, in order to program pathways of prevention, health education for the single patient and the whole community*

Applying knowledge and understanding (Dublino 2)

- Evaluate factors that determine risk for psychosocial and physical health, both for single person and the community, in collaboration with other health professionals*

Making judgements (Dublino 3)

- Critically evaluate the outcomes of care decisions, based on patient's characteristics and the standards of care*

Communication skills (Dublino 4)

- To transmit verbal and written informations to other professionals of care, in a clear and unambiguous way, in respect of privacy
- Argue and discuss their work, and the decision taken, with colleagues and other professional figures

Learning skills (Dublino 5)

- Assess their own training needs and implement effective learning and self-learning strategies and methods
- Integrate and improve their knowledge and skills by sharing information and reflections within the work team

5. prerequisites

Basic school education and knowledge of basic science subjects are required: chemistry, physics and biology

6. TEACHING METHODS

Teaching methods include lectures with extensive use of slides and images, such as to facilitate the acquisition of basic histological, anatomical and physiological informations and knowledge, also through visual stimulation. Lectures are accompanied by practical exercises on anatomical mannequin and anatomical tables. Students actively participate in the lessons, through questions and requests for clarification and deepening of the topics. The interaction aims at developing a greater knowledge of the technical and scientific language.

7. OTHER INFORMATIONS

The course uses the Blackboard platform to share teaching material. Teachers are always available to learners: they can be contacted by e-mail for an appointment, in order to clarify the teaching topics.

8. METHODS FOR VERIFYING LEARNING AND FOR EVALUATION

Knowledge and understanding (Dublino 1): Written and oral exam

Applying knowledge and understanding (Dublino 2): Written and oral exam

Making judgements (Dublino 3): Written and oral exam

Communication skills (Dublino 4): Written and oral exam

Learning skills (Dublino 5): Written and oral exam

The final assessment corresponds to the weighted average of the evaluation reported (per UFC) in the Written Exam of Histology and in the oral exams of the individual modules of Anatomy and Human physiology:

Histology: The exam consists of n. 15 multiple choice questions (score out of thirty, the exam is passed with at least 9 correct answers: 9/15).

Human Anatomy: oral exam is passed with a score of at least 18/30.

Human Physiology: oral exam is passed with a score of at least 18/30.

The student will obtain the maximum of 30/30 if the weighted average is at least 29.5/30. To obtain honors, the student must obtain a grade of 30/30 in all three modules of the course.

Modules	UFC Written exam	UFC Oral exam	UFC Total
<i>Histology</i>	1	-	1
<i>Human Anatomy</i>	-	4	4
<i>Human Physiology</i>	-	3	3
UFC Total	1	7	8

9. program

HUMAN ANATOMY MODULE

GENERAL: anatomical terminology. Planes and axes of the human body.

LOCOMOTOR SYSTEM - BONES: Vertebral column. Rib cage. Bones of the hip and pelvis as a whole. Bones of the shoulder girdle. Bones of the upper limb. Bones of the lower limb. Skull in general. Cranial fossae. JOINTS: Generalities on the joints.

Articulations of the vertebral column (outline). Main joints of the upper and lower limbs.

MUSCLES: Main muscle groups of the trunk and limbs.

CENTRAL NERVOUS SYSTEM: Spinal cord. Brain (brainstem, cerebellum, diencephalon, telencephalon, main brain areas). Meninges, ventricular cavities and cerebrospinal fluid.

Main nerve pathways.

PERIPHERAL NERVOUS SYSTEM: Notes on the cranial nerves. General information on the spinal nerves.

VISCERAL NERVOUS SYSTEM: Organization of the Parasympathetic and Orthosympathetic systems.

CARDIOVASCULAR SYSTEM: Heart: macroscopic anatomy, conduction system and coronary arteries. Small and large circulation. General information on blood vessels (arteries, capillaries, veins). Course of the aorta artery. Course of the hollow veins.

Vascularization of the limbs.

RESPIRATORY SYSTEM: Airways (nasal cavities, larynx, trachea and bronchi). Lungs: macro- and microscopic anatomy, vascularization, pleural lining.

DIGESTIVE SYSTEM: Notes on the oral cavity, major salivary glands, pharynx, esophagus. Stomach: macro- and microscopic anatomy. Small intestine and large intestine: macro- and microscopic anatomy. Liver: macro- and microscopic anatomy, biliary tract, portal circulation. Exocrine and endocrine pancreas. Vascularization.

URINARY SYSTEM: Kidney: macro- and microscopic anatomy. Urinary tract (outline). Bladder.

MALE GENITAL SYSTEM: Testicles and spermatic ducts. Prostate. Male urethra.

FEMALE GENITAL SYSTEM: Ovary, uterine tube, uterus. Ovarian cycle and menstrual cycle

ENDOCRINE SYSTEM: Pituitary, Adrenal Glands, Thyroid and parathyroid glands, pancreas.

SKIN AND SKIN ADSES: skin, skin appendages, Breast

HUMAN PHYSIOLOGY MODULE

INTRODUCTION TO PHYSIOLOGY: homeostasis, balance maintenance reactions. Cell function and cell membrane physiology.

NERVOUS SYSTEM: neuronal transmission, synapses, action potential, neurotransmitters, neuromuscular and neuroglandular junction. Spinal cord, nerves and spinal reflexes. Physiology and functioning of the brain and cranial nerves, diencephalon, mesencephalic centers, cerebellum. Integrative areas of the brain and motor areas. Nerve integration between receptors, afferent pathways, somatosensory responses. Autonomous nervous system. Sensory organs.

ENDOCRINE SYSTEM: hormones, endocrine glands. Control of hormone production.

THERMOREGULATION: production, heat loss. Physiological mechanisms of response to environmental changes, changes in body temperature from internal and external disease.
BLOOD: components of the blood, lymphatic system.
KIDNEY SYSTEM: nephron, reabsorption filtration, secretion. Mechanisms of regulation of renal function. Balance of electrolytes, fluids, acid-base balance.
RESPIRATORY SYSTEM: physiology of the airways, pulmonary ventilation and respiratory cycle, gas exchanges. Breath center, respiratory reflexes.
MUSCLE SYSTEM: Striated muscle function, neuromuscular transmission, reflexes. Muscle mechanics. Smooth muscle and heart muscle.
CARDIOCIRCULATORY SYSTEM: Heart: electrical and mechanical activity, cardiac output and its regulation. Circulatory system: arterial and venous, pressures, resistances, sphygmic wave, circulation pressure, mechanisms of redistribution of the flow to the organs in physiological and pathophysiological conditions.
DIGESTIVE SYSTEM: digestion, absorption, elimination. Regulation of gastric, pancreatic, intestinal function.
REPRODUCTIVE SYSTEM and hormonal regulation.

HISTOLOGY MODULE

Histological differentiation and the four main groups of tissues:

EPITHELIAL TISSUES: General characteristics of epithelial cells, junctional systems.

Distribution and classification of epithelia. The lining epithelial tissue. Classification based on position, morphology, stratification and apical specializations.

The exocrine glandular epithelial tissue. The endocrine glandular epithelial tissue.

Structural organization. Notes on the main endocrine glands (pituitary, parathyroid, adrenal, epiphyses, islets of Langerhans, interstitial gland of the testis, thyroid).

CONNECTIVE TISSUES: Origin and classification of connective tissues. The extracellular matrix: collagen, reticular and elastic fibers; fundamental substance: chemical components and functions.

Connective tissue proper. The connective tissue cells: macrophages, mast cells, adipocytes, lymphocytes, granulocytes. Classification of connective tissues proper.

Cartilage tissue. Quantity, quality and arrangement of the fibers. Classification.

Fundamental substance: chemical components and functions. Cartilage cells.

Bone tissue. General organization. Compact and spongy bone tissue. Structure and ultrastructure of the bone tissue. The cells of the bone tissue (osteoblasts, osteocytes, osteoclasts). Bone matrix.

Blood. Composition. Blood plasma. Erythrocytes. Leukocytes. Platelets. Functions.

Myeloid tissue and lymphoid tissue: bone marrow, thymus, spleen, lymph nodes, diffuse lymphoid tissue. Morphology and functions.

MUSCLE TISSUES: skeletal, cardiac and smooth striatum. Cell organization and morphological aspects. Myofibrils, myofilaments, sarcomere, sarcoplasmic reticulum.

Mechanism of contraction. Drive plates.

NERVOUS TISSUE: Generalities and subdivisions of the nervous system. General characters and varieties of nerve cells. General histology of the nervous system. Structure of the neuron. Coatings of the cell body and dendrites. Coating sheath of the axon. Nerve fiber. Synapses. Structure and ultrastructure. Conduction of the nerve impulse. Function of the synapses. Neuroglia: ependymocytes, astrocytes, oligodendrocytes, microglia, Schwann cells and satellite cells