



UNIVERSITÀ DI PAVIA

Anno Accademico 2020/2021

HUMAN ANATOMY	
Enrollment year	2020/2021
Academic year	2020/2021
Regulations	DM270
Academic discipline	BIO/16 (HUMAN ANATOMY)
Department	DEPARTMENT OF PUBLIC HEALTH, NEUROSCIENCE, EXPERIMENTAL AND FORENSIC MEDICINE
Course	DIETISTIC
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	(01/10/2020 - 22/01/2021)
ECTS	4
Lesson hours	46 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	POLIMENI MARIAROSA (titolare) - 4 ECTS
Prerequisites	-
Learning outcomes	<p>Part of the course of Anatomy and Applied Biology, the Human Anatomy module introduces the student to the analysis of the human body as a whole, focusing on individual organs and apparatuses as part of it. Topographic relationships between organs as well as their macro and microscopic characteristics are considered in relation to the functional integration of organs and apparatuses.</p> <p>The course is offered to students from seven different biomedical degree programs: the aim is to provide all of them with the basic anatomical knowledge needed to correctly understand the structural and functional characteristics of the human body under normal and pathological conditions, focusing for each group of students on those aspects that will be more relevant to their specific curricula.</p>

CYTOLOGY AND HISTOLOGY

The cell: plasmalemma, cytoplasm, nucleus, membranous and nonmembranous organelles and their functions; intercellular attachment; cell life cycle.

Function, specialization, distribution and classification of epithelial and connective tissues;

Cortical and cancellous bone biomechanical properties;

Skeletal, cardiac and smooth muscle tissues.

Nervous tissue: neurons and glial cells.

ANATOMY:

Anatomical landmarks, regions, directions and planes; body cavities; mucous, serous and synovial membranes; the body wall.

INTEGUMENTARY SYSTEM

Skin: epidermis, dermis and hypodermis.

Accessory structures: hairs, nails and glandular adnexa.

SKELETAL SYSTEM

Hystology and morphofunctional classification of bones and joints.

AXIAL SKELETON

Skull: cranial and facial skeleton. Cranial fossae; Orbital and nasal cavities and paranasal sinuses; Bones associated with the skull: auditory ossicles and hyoid bone.

Cranial joints: sutures, atlo-occipital and temporo-mandibular joint.

Vertebral column: vertebral anatomy and regions; regional differences in vertebral structure and function; spinal curves;

Intervertebral joints and major spine ligaments.

Thoracic cage: Sternum, Ribs;

Sternocostal and costovertebral joints.

APPENDICULAR SKELETON

Shoulder girdle:

Scapula, clavicle and their joints.

Upper limb:

Humerus, radius and ulna; bones of the hand: carpals, metacarpals and phalanges.

Shoulder, elbow, wrist and hand joints.

Pelvic Girdle:

Hip Bones (ileum, ischium and pubes), sacro-iliac joint and pubic symphysis.

Lower Limb:

Femur, patella, tibia, fibula; bones of the foot: tarsus, metatarsus and phalanges;

Hip, knee, ankle and foot joints; foot arches.

SKELETAL MUSCLE SYSTEM

Macro and microscopic anatomy of skeletal muscle; Motor unit; Isotonic and isometric contraction; Aerobic and anaerobic contraction; Slow twitch and fast twitch muscle fibers;

Accessory structures: fascia, synovial bursae and sheaths , fat pads and sesamoid bones.

Muscle morphology and body parts movement: agonist, antagonists and synergists muscles.

Head Muscle: Mimic, oculomotors and mastication muscles.

Superficial and deep musculature of the neck.
Trunk muscles: deep, intermediate and superficial back muscles;
Thoracic cage and abdominal muscles, Diaphragm and respiration muscles.
Shoulder, arm, forearm and hand muscles.
Lower limb muscles: gluteal, thigh, legs and foot muscles.

CARDIOVASCULAR SYSTEM

The blood:

Plasma, figurative elements and their function; Hematopoietic organs.

Heart:

Macro and microscopic anatomy; pericardium; heart wall layers and fibrous skeleton of the heart; heart chambers, valves and blood flow;
The Conducting system and autonomic cardiac activity regulation;
Coronary vessels.

Blood vessels: histological organization of arterial and venous vessels and capillary network.

Pulmonary Circle:

pulmonary arteries and veins.

Systemic Circle

Arterial system:

Aorta and major systemic arterial vessels.

Venous system:

Superior and inferior vena cavae veins and their main afferent vessels;

Superficial and deep vein networks; Valve systems and active mechanisms to support venous return; Portal circulation.

Lymphatic system:

Main trunks and lymphatic plexuses

Lymphoid tissue, lymph nodes, tonsils

Lymphoid organs: bone marrow, thymus, spleen

The immune system

Mechanisms of hemostasis, inflammation and immune response.

RESPIRATORY SYSTEM

Macroscopic aspects and microscopic structure of the upper and lower respiratory tracts and lungs.

Nose, nasal cavities and paranasal sinuses; Respiratory and olfactory mucous membranes.

Pharynx and Larynx structure: phonation and swallowing mechanisms.

Trachea, bronchi and tracheobronchial tree;

Lungs, pleurae, respiratory muscles action.

DIGESTIVE SYSTEM

Macroscopic and microscopic structure of the gastrointestinal tract and accessory digestive organs.

Organs function in the digestive process: Ingestion, digestion and absorption; Peristalsis and segmentation.

Oral cavity: vestibule, tongue and teeth (tooth structure, shapes and function; occlusion; deciduous and permanent teeth; dental formula).

Pharynx; esophagus; stomach;

Small intestine: duodenum, jejunum, ileum;

Large intestine: cecum, colon (ascending, transverse, descending, sigmoid) rectum;

Accessory glands:

major salivary glands (parotid, submandibular and sublingual glands);
Liver, gallbladder and biliary tree; liver blood supply and portal venous system;

Pancreas

URINARY SYSTEM

Macroscopic and microscopic structure of kidney and urinary tracts.

Kidney:

peritoneum, renal fascia and adipose capsule of the kidney;

Medulla and cortex regions, renal pyramid, lobes and lobules;

Nephron: renal corpuscle and tubule,

Vascular system and renal function;

Collecting system: minor and major calyces, renal pelvis, ureter, bladder, urethra.

REPRODUCTIVE SYSTEM

gonads, genital tracts, accessory glands, external genitalia, perineum.

Male and female reproductive system: analogies and morphological and functional differences.

Anatomical structures and spermatogenesis, oogenesis, fertilization and embryonic development processes.

Male reproductive system:

testes: seminiferous and straight tubules, rete testis, efferent ducts epididymis, deferens and ejaculatory ducts, urethra, spermatic cord, inguinal canal;

Accessory sex glands: seminal vesicles, prostate gland, bulbourethral glands

External genitalia: penis, scrotum.

Female reproductive system:

Ligaments and stabilization of the female reproductive tract in the pelvis; uterovesical and rectouterine pouch.

Ovary: microscopic structure, Ovarian follicles and their developmental stages.

Ovarian cycle: ovulation, follicular and luteal phases; corpus luteum and corpus albicans.

Uterus: macroscopic and microscopic structure; uterine cycle: endometrial changes in menses, proliferative and secretory phases.

Vagina

Female accessory sex glands: paraurethral and greater vestibular glands

External genitalia: mons pubis, minora and majora labia, Bartholino's and Skene's glands, clitoris.

ENDOCRINE SYSTEM

Macroscopic and microscopic structure of main endocrine glands and their functional interactions; Hormones and their action mechanisms; endocrine and neuroendocrine control.

Hypothalamus

Pituitary gland: neuro- and adenohypophysis

Pineal gland

Thyroid and parathyroid gland

Thymus

Adrenal glands

Endocrine function of pancreas, heart and kidney

NERVOUS SYSTEM

Morphological and functional classification of neurons and glial cells

Central nervous system:

Spinal cord: macroscopic and microscopic organization; neuromeres and dermatomes; Grey and white matter organization; Meninges: dura mater, arachnoid and pia mater.

Brain:

Cranial meninges: falx cerebri and cerebelli, tentorium cerebelli, diaphragma sellae

Ventricles system: production and circulation of cerebrospinal fluid; brain-blood barrier

Brainstem: medulla oblongata, pons, midbrain

Cerebellum

Diencephalon

Telencephalon:

Hemispheres, lobes, fissures, sulci, gyri

Grey and white matter distribution

Cerebral cortex: structure, cortical sensory and motor areas, associational areas, integrating centers, higher functions

White matter organization: association, commissural and projection tracts

Basal ganglia: anatomical and functional interaction with cortex and other central nervous system parts

Limbic system

Peripheral nervous system:

Spinal nerves and plexuses; Reflex arcs

Cranial nerves: general overview, nomenclature and main functions

Sensory pathways:

posterior columns, spinothalamic and spinocerebellar pathways

Motor pathways:

Somatic nervous system: pyramidal (corticospinal and corticonuclear tracts) and extrapyramidal tracts

Autonomic nervous system:

Sympathetic and parasympathetic division; anatomical organization, preganglionic and postganglionic neurons, peripheral ganglia, neurotransmitters

Sensory organ and tracts overview:

General and special receptors; Olfaction, taste, hearing and balance (inner ear), sight (eye).

Teaching methods

Frontal lessons

For Medical radiology, related imaging techniques and radiotherapy, Orthopaedic techniques and Neurophysiopathology techniques only: Exercises on anatomical models and dynamic 3D visual resource

Reccomended or required readings

Martini, Timmons, Tallitsch - Anatomia Umana - Edises

Assessment methods

Oral examination

Further information	-
Sustainable development goals - Agenda 2030	\$bl legenda sviluppo sostenibile