UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Anatomy 1

**2425-1-H4101D002-H4101D006M**

## Aims

The objectives of the course are to provide expertise in normal anatomy of structures and organs of the human body.
Teachnig will include reference to topographic, radiologic, and clinical anatomy.

Practical activities using models (also virtual 3D), light microscope observations and clinical case simulations will be used to reach the teaching objectives.

## Contents

The primary goal of the course is to provide a good knowledge of the embryonic development and of the gross anatomy of the human body, and of the aging changes required for a correct physical examination and understanding of the diseases pathogenesis.

## Detailed program

**GENERAL ANATOMY**

The different approaches to the study of human anatomy: gross and microscopic anatomy; systematic, topographic, regional, radiological, clinical anatomy.

Principles of organization of the human body: cells, tissues, organs and systems. Serous cavity and connective spaces, their location and content. Development of the body cavities from the primitive intraembryonic coelom.

Anatomical terminology: planes, axes, lines and anatomical landmarks; terms of position, terms related to movements.

REGIONAL ANATOMY***THE HEAD***

Surface anatomy.

Skeletal landmarks of the head: nasion, vertex, superior nuchal line, external occipital protuberance, mastoid process, zygomatic arch, pterion, anterior and posterior borders of the ramus of mandibula, superciliary ridges.

Basic anatomy.

The scalp and its layers. Muscle of the scalp. Muscles of facial expression and muscle of mastication.

Bones of the face. The skull and cranial fossae (see muscular-skeletal system). Temporomandibular joint.

External nose, nasal cavity and paranasal sinuses. Bony skeleton. External, internal opening and walls of the nasal cavity. Location, relations and morphological features of paranasal sinuses.

Parotid region: parotid gland and duct, their location, relations and morphological features. Submandibular and sublingual glands: location, relations and morphological features.

Oral cavity: subdivision in vestibule and mouth cavity proper; teeth (deciduous and permanent) and their general structure; lips; palate and floor of the mouth with their muscles; tongue, its relations and morphological features, extrinsic and intrinsic muscles.

The tonsils in the nasopharynx and oropharynx (Waldeyer's limphatic ring)

Orbital region: Eyelids, lacrimal apparatus, orbital margins and walls, openings into the orbital cavity, orbital muscles.

Main arteries, veins and nerves contained in the head.

The eye: see “Special senses” in ANATOMY 2B

The ear: see “Special senses” in ANATOMY 2B

***THE NECK***

Surface anatomy.

Surface landmarks of the neck: hyoid bone, upper border of the thyroid cartilage, isthmus of the thyroid gland, suprasternal notch, nuchal groove, sternocleidomastoid and trapezius muscles, platisma muscle, external jugular vein.

Basic anatomy.

Skin, superficial fascia, platysma muscle. Hyoid bone. Deep cervical fascia: investing, pretracheal and prevertebral layers, carotid sheath. The triangles of the neck: anterior, posterior and their subdivision. Superficial muscles: sternocleidomastoid and trapezius. Suprahyoid and infrahyoid muscles. Anterior, lateral and posterior vertebral muscles with focus on scaleni muscles.

Organs located in the neck: thyroid and parathyroid glands, pharynx , larynx, cervical portion of esophagus and trachea.

Main arteries, veins, nerves and plexuses contained in the neck.

***THE TORAX***

Surface anatomy.

Skeletal landmarks on anterior chest wall: suprasternal notch, sternal angle, xiphisternal joint, subcostal angle, ribs; Skeletal landmarks on posterior chest wall: spinous processes of the thoracic vertebrae, superior angle, inferior angle and spine of the scapula. Projection of breast and nipple, heart, lungs and pleura, aortic arch, superior vena cava, tracheal bifurcation on the thoracic wall. Lines of visceral and parietal pleural reflection, costodiaphragmatic recess.

The thoracic wall.

Skin and extrinsic chest muscle (thoracoappendicular and spinoappendicular). Thoracic cage and its components: thoracic vertebrae, ribs, sternum and costal cartilages. Intercostal spaces, intercostal muscles, intercostal vessels and nerves, endothoracic fascia, suprapleural membrane. Detalied knowledge of diaphragm: origin, morphological features, openings and structures that each one transmit, action, blood and nerve supply. Thoracic outlet: its relations to vessels, nerves and organs.

The thoracic cavity.

Division into a median part, the mediastinum, and two lateral parts, the pleural spaces containing lungs.

Mediastinum: definition, borders, subdivision in superior and inferior (plane of division). Vessels, nerves, organs and other structures contained in the two parts of mediastinum, with major focus on heart and pericardium. Thoracic duct.

Organs contained in the thoracic cavity: lungs and pleurae, heart and pericardium, trachea, principal bronchi and bronchial tree, thymus, esophagus

Main arteries, veins, nerves and plexuses contained in the thoracic cavity

***UPPER AND LOWER LIMBS***

Detailed knowledge of all the bones, joints and muscles.

Relation to blood vessels, nerves and limphatic structures: in ANATOMY 2A

SYSTEMATIC ANATOMY**

***MUSCULAR-SKELETAL SYSTEM (LOCOMOTOR)***

Classification of bones, muscles and joints, their general structure and function.

*The skull.* Neurocranium and facial bones. General architecture of the skull and main characteristics of the individual bones. External view of the skull as a whole: anterior, superior, posterior. Lateral view: temporal, infratemporal and pterygopalatine fossae and their contents. Inferior view: anterior, middle and posterior region. The cranial cavity: vault and base. Base of the skull: anterior, middle, posterior cranial fossae with their major foramina; nerves and/or vessels that each foramen transmits. Cranial sutures and craniometric points. Neonatal skull. Nasal cavity, orbital cavity, paranasal sinuses. Temporomandibular joint. Mimic and masticatory muscles.

*Vertebral column*. General characteristics of the vertebrae and regional differences. Atypical cervical vertebrae: atlas and axis. Atlanto-occipital and atlanto-axial joints. Other joints of the vertebral column. General features of the muscles of the back.

*Neck*. Muscles and fasciae of the neck.

*Chest*. Bones and cartilages of the thoracic cage. Joints of the ribs and costal cartilages. Extrinsic and intrinsic muscles of the thorax, respiratory muscles, in particular diaphragm muscle.

*Shoulder girdle and upper limb*. Anatomical characteristics of the different bones. Shoulder, elbow, radio-ulnar, wrist joints, general features of the other joints. Muscles of the shoulder, the rotator cuff; arm, forearm and hand muscles.

*Pelvis and lower limb*. Morphological feature of hip bones in detail, and of the other bones of the lower limb. Joints and ligaments of the pelvis, hip, knee; tibio-fibular, ankle and tarsal joints; general features of the other joints. Hip, thigh, leg and foot muscles. Scarpa's triangle and adductor canal. Femoral sheath and femoral canal.

*Abdominal wall :* in ANATOMY 2A

*Pelvic floor:* in ANATOMY 2A

***CARDIOVASCULAR SYSTEM***

*Heart.* morphological features of external surface, cardiac chambers, cardiac valves, conducting system. Structure of the heart wall. Large arteries and veins leaving or entering the heart. Pericardium: serous, fibrous pericardium and pericardial sinuses.

*Blood vessels*. Vessels general structure: arteries, veins, capillaries. Anastomoses. Fetal circulation and its modification at birth. General organization of adult circulatory system, pulmonary and systemic vascularization.

Detailed systemic circulation : in ANATOMY 2A

***LYMPHATIC SYSTEM***

in ANATOMY 2A

***RESPIRATORY SYSTEM***

Nose, nasal and paranasal cavities: see regional anatomy. Position, relations and morphological features of the respiratory tract organs: pharynx, larynx, tracheo-bronchial tree, lungs. Pulmonary segments and lobes.

Pleurae: visceral and parietal pleura, pleural cavity, regional nomenclature.

***DIGESTIVE SYSTEM***

Oral cavity, parotid region, esophagus: see regional anatomy.

Other gastrointestinal tract organs: in ANATOMY 2A

***URINARY SYSTEM***
in ANATOMY 2A

***ENDOCRINE SYSTEM***

Position, relations and morphological features of the thyroid and parathyroid glands.

Other organs of the endocrine system: in ANATOMY 2A

***FEMALE REPRODUCTIVE SYSTEM***

in ANATOMY 2A

***MALE REPRODUCTIVE SYSTEM***
in ANATOMY 2A

***INTEGUMENTARY SYSTEM***
Skin and its appendages. Different types of skin. Skin functions. Skin lines. Age-related skin changes. Mammary gland: position, relations and morphological features. Lymphatic drainage of the mammary gland.

***NERVOUS SYSTEM***

in ANATOMY 2A-2B

**CLINICAL ANATOMY**

The anatomical bases of some common diseases involving different organs and systems will be treated during lessons and laboratories and also discussed through clinical cases.

**LABORATORIES**

Lectures will be partnered by multi approach interactive laboratories, to allow students a closer study of the examined topics. In particular, students will use both different anatomy models (Skull and skeleton; Upper and Lower limbs; Heart; Thorax and Abdomen; Male and Female Pelvis; Eye and Ear; Brain), and multimedia sources such as 3D virtual models, to recognize the main features of each organ. Some laboratories will focus on computer-assisted learning, to allow students to recognize radiological images, such as computed tomography and magnetic resonance imaging. In addition, some laboratories will be focused on quizzes based on lectures' topics, and/or on basic clinical cases, later discussed with the teacher.

## Prerequisites

College-level scientific knowledge

## Teaching form

18 lectures 2h/each in presence
12 practical interactive lessons 2h/each in presence

Frontal lessons, seminars and interactive and problem-solving laboratories with clinical case simulations will be in italian. Virtual dissection by using the 3D Anatomage Table.

## Textbook and teaching resource

Suggested Textbooks for Anatomy 1-2A-2B
-G. Anastasi e altri autori. Trattato di Anatomia Umana (3 volumi). Edi-Ermes (ed).
-"Prometheus" testo-atlante di Anatomia, II edizione, 3 volumi
-S. Standring. Anatomia del Gray – Le basi anatomiche per la pratica clinica – EDRA

-Chiarugi. Collana Istituzioni Anatomia dell'Uomo. Opera in 5 volumi - a cura di Chiarugi, Bucciante. Piccin
-H. Ellis/V. Mahadevan. Anatomia clinica (ed. Italiana a cura di F. Cappello). Idelson-Gnocchi
Libri di testo e/o approfondimento sul sistema nervoso:
-Vercelli A. Boido M. Neuroanatomia funzionale - Idelson-Gnocchi
-L. Heimer. The Human Brain and Spinal Cord –Functional neuroanatomy and dissection guide. Springer- Verlag (ed)
-Dockery P, Gruener G, Mtui E - Fitzgerald. Neuroanatomia con riferimenti funzionali e clinici- Edra
-Barr: Il Sistema Nervoso dell'Uomo. Basi di Neuroanatomia di Kiernan JA e Rajakumar N. Edises
-Istituzioni di Anatomia dell'Uomo - Sistema nervoso centrale (a cura di E. Gaudio) - Piccin
-Istituzioni di Anatomia dell'Uomo - Sistema nervoso periferico ed organi di senso (a cura di R. De Caro) - Piccin
-Haines DE. Neuroanatomia nel contesto clinico. Strutture, sezioni, sistemi e sindromi. Atlante. Edi-Ermes
-Blumenfeld H. Neuroanatomia attraverso casi clinici – (a cura di E. Pegoraro, C. Briani, G. Solaru) - Piccin

Atlas:
-Netter. Atlante di anatomia umana - Edra
-Anatomia umana. Atlante. Curatori: G. Anastasi, C. Tacchetti - Edi. Ermes
-Sobotta – Atlante di Anatomia Umana - Elsevier

Please, take into consideration the last edition

## Semester

Annual; this teaching unit will be in the 1st term

## Assessment method

An extensive mid-course assessment is scheduled for the end of the first semester, for the details see General Syllabus of "Human Anatomy and Histology".

## Office hours

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## Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY