UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

# Anatomy 2 B

**2021-1-H4101D002-H4101D009M**

## Aims

The objectives of the course are to provide expertise in normal anatomy, cytology, histology, embryology. 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

***NERVOUS SYSTEM***

Description of the general organization of the nervous system, of the different structures componing the central nervous system and of the organization and distribution of the peripheral nerves: see ANATOMY 2A

***AUTONOMIC NERVOUS SYSTEM***

General organization of the autonomic nervous system and its main division in two parts, sympathetic and parasympathetic. Afferent and efferent nerve fibers. Preganglionic and postganglionic fibers. Neurotransmitters involved. Autonomic ganglia. Large autonomic plexuses.

Anatomical, physiological and pharmacological differences between sympathetic and parasympathetic divisions. Sympathetic division: sympathetic trunks and ganglia, rami communicantes. Parasympathetic division: cranial and sacral components, cranial nerves involved. Functions of the autonomic nervous system.

The enteric nervous system

Some important autonomic innervation: eye, salivary and lacrimal glands, urinary bladder, gastrointestinal tract, heart, medulla of suprarenal gland, genital organs, skin.

***MAJOR NEURAL PATHWAYS***

Spinal and medial lemniscal tracts ; spinocerebellar tracts; lateral and medial descending motor systems; cerebellar and basal ganglia motor control; olfactory, gustatory, visual, auditory and vestibular systems. Parallel basal ganglia circuits. Diffuse projection systems. Medial longitudinal fasciculus.

Description of the organization, course and relations of each of these pathways, their origin, termination and synaptic stations.

***CLINICAL NEUROANATOMY***

***Central nervous system***
Anatomic basis of some common central nervous system diseases: ischemic brain injuries, cerebral hemorrhages, cerebral malformations, hydrocephalus, space-occupying lesions, cerebral herniations.
Consciousness and its disorders.
Mirror neurons.

***Peripheral nervous system***

Examples of clinical syndromes related to lesions of the roots, nerve plexuses and spinal nerves and their anatomo-functional basis.

Examples of clinical syndromes related to lesions of the nuclei and fibers of the cranial nerves and their anatomo-functional basis.

***SPECIAL SENSES***

***The eye****. Coats of the eyball. Eyelids. Lacrimal apparatus. Blood supply and innervation of the eye.*

***The ear****. External ear. Middle ear (tympanic cavity). Internal ear (Labyrinth). Blood supply and innervation of the ear.*

***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 (Upper and Lower limbs; Eye and Ear; Skull and Brain), and multimedia sources such as 3D virtual models, to recognize the main features of each organ. 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

See Anatomia Istologia Umana

## Teaching form

Frontal lessons and practical sections.

During Covid emergency lessons will take place partly in presence and partly by recorded lessons.

## Textbook and teaching resource

-G. Anastasi e altri autori. Trattato di Anatomia Umana (3 volumi). Edi-Ermes (ed), 2009.

-"Prometheus" testo-atlante di Anatomia, II edizione, 3 volumi

-S. Standring. Anatomia del Gray – Le basi anatomiche per la pratica clinica – 41° ed. EDRA

- - H. Ellis/V. Mahadevan. Anatomia clinica (Italian edition F. Cappello). Idelson-Gnocchi 2019

More on the central nervous system:

Vercelli A. Boido M. Neuroanatomia funzionale - Idelson-Gnocchi (2019)

L. Heimer. The Human Brain and Spinal Cord –Functional neuroanatomy and dissection guide. Springer-Verlag (ed), 1995.

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. II edizione. Edises (2015)

Haines DE. Neuroanatomia nel contesto clinico. Strutture, sezioni, sistemi e sindromi. Atlante. Edi-Ermes

Atlas;

- Netter. Atlante di anatomia umana, Frank H. Netter, Editore: Edra

- Anatomia umana. Atlante. Curatori: G. Anastasi, C. Tacchetti, Editore: Edi. Ermes

## Semester

annual

## Assessment method

A mid-course assessment is scheduled for the end of the first semester, by a multiple choice quiz focused on Citology, Histology, Embriology, head and neck and thoracic region anatomy (nervous system and vascular system excluded) and musculoskeletal system.

At the end of  the Course an oral examination is employed to test students' knowledge and it will follow a practical demonstration at the light microscope of the capacity of the student to recognize the normal microscopic features of human organs.

During the exam anatomical models and diagnostic images might be used to assess students' knowledge.

During the Covid-19 emergency oral exams will be performed only online, using Esamionline platform for the written examination and the WebEx platform (with a public link on E-learning) for the oral one.

## Office hours

See Anatomia Istologia Umana