



## MEDICINE AND SURGERY

**Course: Building Bodies**

**Year: 1<sup>st</sup>**

**Period: 1<sup>st</sup> semester**

**Credits: 11**

### **Objectives**

#### **Knowledge and understanding**

By the end of the course, students will know how the human body and its main organ-systems develop and the most relevant morphological features of tissues and organs in relation to their function. They will also know the most important congenital malformations.

Knowledge acquired during this course together with knowledge acquired during the course of Body Architecture is necessary for the understanding of other preclinical disciplines (e.g physiology) and clinical disciplines. The content of the course is especially propaedeutic to the course of Body Architecture and to the course of Body at work 2.

The importance of studying the subjects of the course in relation to their relevance for the understanding of physiology and physiopathology and the acquisition of knowledge of clinical importance will be fostered by correlating the topic treated with the signs and symptoms of the Priority Presenting Problems Portfolio.

#### **Applying knowledge and understanding**

By the end of the course students will be able to

- Identify different tissue and organs and summarize their main characteristics
- Compare and contrast their morphological features
- Relate the morphological features of tissues and organs to their function
- Apply the knowledge of the development of the human body to the study of gross and regional anatomy
- Apply the knowledge acquired to simple clinical or research-related scenarios and in general to problem solving activities

#### **Making judgements; Communication skills; Learning skills.**

By the end of the course students will have

- developed some abilities to communicate and work in team
- acquired some learning skills such as study in a group, organize knowledge, revise and retain information, select information.



## **Contents**

The course can be ideally divided into 4 domains: histology, general embryology, organogenesis, and organ structure. While the lectures of histology and general embryology are proposed to students in sequence, the lectures of organogenesis and organ structure are intermingled so that the organogenetic aspects always precede the explanation of the adult structural aspect. The syllabus is organized by learning outcomes specific for each lecture or for a group of lectures. The learning outcomes are available for enrolled students on the Learning Management System.

### **Module of Histology**

This module will describe how cells organize into different tissues and how the characteristics tissue reflect their functional role.

Topic 1: Introduction to histological methods. From tissue sample collection to the observation at the microscope

Topic 2: Instruments for morphological analysis and biomedical applications

Topic 3: The epithelial tissue. 1: Apical and basolateral specializations of epithelial cells. Cell junctions.

Topic 4: The epithelial tissue. 2: Lining epithelia

Topic 5: The epithelial tissue. 3: Exocrine glands

Topic 6: The epithelial tissue. 4: Endocrine glands

Topic 7: The connective tissue. 1: Cellular components and extracellular matrix

Topic 8: The connective tissue. 2: Proper connective tissue

Topic 9: Specialized connective tissues. 1: Cartilage

Topic 10: Specialized connective tissues. 2: Bone and osteogenesis

Topic 11: Specialized connective tissues. 3: Blood and haemopoiesis

Topic 12: Lymphoid organs (lymph nodes, spleen, thymus, tonsils)

Topic 13: The muscle tissue. 1: Skeletal and cardiac muscle tissues

Topic 14: The muscle tissue. 2: Smooth muscle tissue.

Topic 15: The nervous tissue. 1: Neurons. Nerve fibers

Topic 16: The nervous tissue. 2: Synapses. Neuroglia. Peripheral nerve terminals

### **Module of general Embryology, Organogenesis and Organ structure**

During this module, the main events characterizing male and female gametogenesis, fertilization and implantation of the human embryo will be addressed. Following a description of the early stages of



embryogenesis, some major topics in organogenesis will be discussed as to understand the main morphological events and the related molecular aspects characterizing the development of the body and its various organ systems. Throughout the module, the most relevant congenital defects will be discussed. On this basis, the morphological and structural features of mature organs will be described stressing functional aspects.

### *General embryology and organogenesis*

Topic 1: Introduction to embryology and principles of male and female gametogenesis

Topic 2: Fertilization and early stages of the embryo development (week-1 and week 2)

Topic 3: 3<sup>rd</sup> week: Gastrulation.

Topic 4: 4th week: establishing the body plan.

Topic 5: Maternal-fetal relationship.

Topic 6: Development of the digestive system.

Topic 7: The primordial pharynx and the pharyngeal apparatus.

Topic 8: Development of the lower respiratory tract.

Topic 9: Development of the urogenital system.

Topic 10: Development of the cardiovascular system, fetal circulation, neonatal circulation.

### *Organ structure*

Topic 1: Principles of organ architecture

Topic 2: Structure of blood vessels and lymphatic vessels. Coming and going

Topic 3: Macroscopic aspects, functional architecture and structure of the esophagus and gastrointestinal tract.

Topic 4: Macroscopic aspects, functional architecture and structure of the liver

Topic 5: Macroscopic aspects, functional architecture and structure of the lower respiratory tract

Topic 6: Macroscopic aspects, functional architecture and structure of the kidney, ureters and lower urinary tract.

Topic 7: Macroscopic aspects, functional architecture and structure of the male and female reproductive system.

Topic 8: Heart and pericardium.



### **Histology/microscopic anatomy practical activity.**

Learning outcomes:

- recognize the tissues composing an organ
- identify the histological architecture of the organ
- reach a final identification of the organ

### **Teaching Methods**

**Lectures:** the main purpose of lectures is to transfer knowledge to students by guiding them through the most relevant subjects of the disciplines included in the course of BB.

Most lectures will be preceded by simple priming activities posted on the LMS and followed by simple post lecture activities. Students are expected to participate to lectures in a proactive manner and to take notes as part of the learning process.

All lectures will be held synchronously, either in presence or using Teams.

**Group work activities/activation of knowledge:** the purpose of these activities is to activate and solidify knowledge acquired during lectures and independent study, in a collaborative learning setting.

Participation is mandatory. Students that cannot be on Campus for reasons related to the pandemics will participate in Teams.

### **Verification of learning**

Assessment of learning will take place at the End of the Semester (ESE, End of Semester Exam) through a written test and a practical exam on histological preparations.

#### **Written test**

Questions may include: Multiple choice questions, True and False questions, Drag and drop onto a background image, Drag and drop into text, Matching, Select missing words, Short answers

#### **Description and diagnosis of histological preparations**

Students' ability to describe and diagnose histological preparations at the microscope (or on virtual images) will be evaluated at the end of the course.



## **Texts**

Pawlina

Histology A Text And Atlas - With Correlated Cell And Molecular Biology,  
8<sup>th</sup> International Edition.

Wolter Kluwer 2020

Bruce M. Carlson

Human Embryology and Developmental Biology, 6th edition

Elsevier, 2018

Gary C. Schoenwolf et al.

Larsen's Human Embryology, 5th Edition

Elsevier, 2015

Kevin L. Moore, T.V.N Persaud, Mark G.Torchia

The developing human. Clinically oriented embryology, 11th edition

Elsevier, 2020