

Course Unit	Anatomophysiology I	Field of study	Expertise Sciences
Bachelor in	Biomedical Laboratory Sciences	School	School of Health
Academic Year	2023/2024	Year of study	1
Type	Semestral	Semester	1
Workload (hours)	135	Contact hours	T - , TP 52, PL - , TC - , S - , E - , OT 8, O -
Level	1-1	ECTS credits	5.0
Code	9995-804-1102-00-23		

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Nuno Miguel da Cruz Neves

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. To identify topographical regions.
2. To relate anatomical structures based on anatomic plans.
3. To describe microscopic and macroscopic structure of osteo-articular and integumentary systems.
4. To describe histology of muscle contraction and the attachments and actions of main skeletal muscles.
5. To describe histological, anatomical aspects of heart and blood vessels, physiological events of cardiac cycle and of hemodynamics.
6. To describe blood cells and their functions.
7. To describe anatomical and histological aspects of respiratory system components and physiological aspects of pulmonary ventilation, gas transport and exchange in pulmonary and systemic capillaries.
8. To describe anatomical, histological and physiological aspects of each gastrointestinal tract segment and of pancreas and liver, namely hepatic functions on bile secretion and metabolism.

### Prerequisites

Before the course unit the learner is expected to be able to:  
none

### Course contents

1 Introduction: Topographical regions. Anatomic plans. 2 Osteoarticular, muscle and integumentary systems: Skin. Skeletal tissues. Bones. Joints. 3 Muscle. 4 Cardiovascular System: Anatomy and histology. Cardiac cycle. Hemodynamics. 5 Haemolymphoid system: Blood. Lymphoid tissue. Immunity. 6 Respiratory System. Anatomy and histology. Physiology 7 Alimentary system. Anatomy and histology. Gastrointestinal physiology. Hepatic functions

### Course contents (extended version)

1. INTRODUCTION TO ANATOMY STUDY
  - Topographical regions
  - Anatomical position. Plans. Concepts: cranial/caudal, dorsal/ventral, medial/lateral.
2. INTEGUMENTARY AND OSTEOARTICULAR SYSTEM
  - Skeletal tissues: bone and cartilage. Histogenesis of bone. Growth plate.
  - Vertebral column and skeleton of thorax: vertebrae, sternum and ribs. sacrum, coccyx,
  - Skull. Orbit and nasal cavity. Bony palate. Cranial bones.
  - Upper limb: scapula, clavicle, humerus, radius, ulna, carpal bones, metacarpal bones, phalanges.
  - Lower limb: innominate bone, femur, tibia, fibula, patella, tarsal and metatarsal bones, phalanges.
  - Concept of joint. Functional aspects.
  - Non-synovial joints: suture, synchondrosis, syndesmosis, symphysis and gomphosis.
  - Synovial joints: articular cartilages, fibrous capsule, articular disc or meniscus.
  - The movement. Rotation axes. The movements on synovial joints.
  - Integumentary system. Epidermis and dermis. Hair follicles. Sweat and sebaceous glands. Nails.
3. MUSCULAR SYSTEM
  - Cytological aspects of muscle fibre
  - Physiology of muscle contraction.
  - Attachments and actions of main skeletal muscles.
4. CARDIOVASCULAR SYSTEM
  - Histological aspects of blood vessels and their relation with functional aspects.
  - The heart anatomy: cardiac chambers and valvular complexes.
  - Myocardium. Electrical events: depolarization and repolarization. Conducting system of myocardium.
  - Systole and diastole. Cardiac cycle.
  - Hemodynamics. Arterial pressure. Microcirculation.
  - Localization of main blood vessels of arterial and venous systems.
5. HAEMOLYMPHOID SYSTEM
  - Blood cells and their functions. Plasma
  - Haemopoiesis. Marrow bone. Physiological aspects of erythropoiesis.
  - Primary and secondary lymphoid tissue. Functions of B and T lymphocytes on immunological response.
  - Blood groups. ABO and Rh systems. Others systems: Kell, Duffy, Kidd, Lutheran, Lewis, P.
  - Haemostasis
6. RESPIRATORY SYSTEM
  - Anatomical aspects: nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, lungs.
  - Histological aspects: respiratory epithelium, respiratory membrane.
  - Pulmonary ventilation, gas exchange and transport in the blood. Regulation
7. ALIMENTARY SYSTEM
  - Oral cavity and salivary glands. Oesophagus. Stomach: gastric mucosa. Small and large intestine.
  - Pancreas. Histological structure. Enzyme component and aqueous component of pancreatic juice.
  - Liver. Structure of hepatic lobule. Blood circuitry in hepatic lobule. Hepatic function.
  - Physiology. Motility. Enzymatic activity. Absorption. Endocrine and paracrine mediators.
8. INTEGUMENTARY SYSTEM

### Recommended reading

1. Drake RL, Vogl AW, & AWM, Mitchell (Eds. ). (2010). Gray's Anatomia para Estudantes (2ª ed. ): Rio de Janeiro: Editora Elsevier.
2. Netter FH (Ed. ). (1987). Anatomia y Fisiologia. Colección CIBA de Ilustraciones Médicas. : Barcelona: Salvat Editores.
3. Junqueira, L. C. , & Carneiro, J. (Eds. ). (1999). Histologia Básica (9ª ed. ): Rio de Janeiro: Guanabara Koogan.
4. Berne, R. M. , & Levy, M. N. (Eds. ). (2004). Fisiologia. (5ª ed. ): Rio de Janeiro: Mosby.
5. Hoffbrand, A. V. , Petit, J. E. , & Moss, P. A. H. (Eds. ). (2004). Fundamentos de Hematologia. (4ª ed. ): Porto Alegre: ARTMED.

### Teaching and learning methods

Theoretical-practical lessons are brief expositions of study subject based on images, followed by interaction between groups of pupils. Tutorial lessons are based on de search of answers for proposal questions oriented by the teacher, this search is based on bibliography. The individual work of the pupil is guided with resource at practical questions about study subject.

### Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
  - Intermediate Written Test - 50%
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2. Alternative 2 - (Regular, Student Worker) (Final)
  - Final Written Exam - 100%
3. Alternative 3 - (Regular, Student Worker) (Supplementary)
  - Final Written Exam - 100%
4. Alternative 4 - (Regular, Student Worker) (Special)
  - Final Written Exam - 100%

### Language of instruction

Portuguese

### Electronic validation

Nuno Miguel da Cruz Neves	Maria Cristina Martins Teixeira	Ana Maria Nunes Português Galvão	Adília Maria Pires da Silva Fernandes
31-10-2023	06-12-2023	06-12-2023	07-12-2023