



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Medicina di Precisione in area Medica, Chirurgica e Critica		
ACADEMIC YEAR	2024/2025		
BACHELOR'S DEGREE (BSC)	DENTAL HYGIENE		
INTEGRATED COURSE	BIOLOGY AND PHYSIOLOGY- INTEGRATED COURSE		
CODE	18973		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	BIO/13, BIO/09		
HEAD PROFESSOR(S)	MUDO' GIUSEPPA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	CORRADO CHIARA	Professore Associato	Univ. di PALERMO
	MUDO' GIUSEPPA	Professore Ordinario	Univ. di PALERMO
CREDITS	7		
PROPAEDEUTICAL SUBJECTS	19981 - ANATOMY WITH ELEMENTS OF HISTOLOGY		
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>CORRADO CHIARA Wednesday 15:00 17:00 Dip. DiBiMed, Sez. di Biologia e Genetica -via Divisi 83, 90133 Palermo chiara.corrado@unipa.it</p> <p>MUDO' GIUSEPPA Monday 00:00 00:01 Previo accordo</p>		

DOCENTE: Prof.ssa GIUSEPPA MUDO'

PREREQUISITES	Knowledge of the principles of physics, biophysics, and biochemistry useful to the cells and the physiology of the organs understanding. Furthermore, the learner must satisfy the following prerequisites relating to key competences: - Literacy competence; - Multilingual competence; - Mathematical competence and competence in science, technology and engineering; - Digital competence; - Personal, social, and learning to learn competence; - Entrepreneurship competence;
LEARNING OUTCOMES	KNOWLEDGE AND UNDERSTANDING At the end of the integrated course, students will develop a knowledge of the fundamental biologic processes of living organisms and the modalities with which inheritance characters are transmitted between generations, structural components of the human body, systems, and an understanding of the main aspects of the functioning of cells, organs, and apparatus. Students will develop the ability to organize an integrated vision of the main functions of the body. They will understand the responses of adaptation of the organ or apparatus in different functional conditions, with particular attention to the stomatognathic apparatus. Students will be familiar with the main functions of the CNC in motor and sensory processes. Overall, they will have an understanding of the integrated relationship between the nervous system and the functioning of the organs with particular attention to the stomatognathic apparatus. APPLYING KNOWLEDGE AND UNDERSTANDING Students will acquire a comprehensive understanding of the human body with an integrated vision of organs and apparatus, and in particular a capacity to apply in their dental hygienist's profession the knowledge of the functional structures of the human body, with particular attention to the structures involved in the function of the buccal cavity. Students will be able to use this knowledge directly as a basis for advancing in the study of the pathophysiological mechanisms and the clinical-instrumental features of the major diseases of dental hygienists. EVALUATION AUTONOMY Students will be able to evaluate and address rationally and independently the problems of functioning of organs and apparatus involved in chewing and therefore in the function of the teeth. Students will develop the ability to correlate the morpho-functional data acquired with interpreting the disorders of the organs involved with chewing. COMMUNICATION SKILLS Students will develop the ability to communicate and disseminate clearly and autonomy, both in their professional and non-professional responsibilities, the knowledge acquired during the course, and the ability to communicate ideas, problems, and solutions related to such knowledge. LEARNING ABILITY Students will develop mastery of basic skills learned in the course, which will allow them to fully pursue the later stages of their studies, update their capabilities, and deepening of their knowledge to improve their overall approach to their professional responsibilities.
ASSESSMENT METHODS	ORAL EVALUATION The oral examination will take place by formulating two to three general questions on the topics covered in the course and described in the teaching program. The test will verify the degree of student learning, its ability to integrate knowledge and the range of opinions on the learned knowledge. Will be assessed for clarity in exposing the subjects learned and the property of language. Particular attention will be reserved for topics characterizing the degree course. The vote is expressed in thirty (30/30) RULES WITH WHICH THE FINAL EVALUATION IS FORMULATED ECTS grade Italian Grade Grade descriptors A – A+ Excellent 30-30 cum laude Eccellente Excellent knowledge of teaching contents; students should show high analytical and synthetic capabilities and should be able to apply their knowledge to solve highly complex problems. B Very good 27-29 Ottimo Very good knowledge of the teaching contents and excellent language control; students should show analytical and synthetic skills and be able to apply their knowledge to solve problems of medium and, in some cases, even higher complexity.

	<p>C Good 24- 26 Buono Good knowledge of teaching contents and reasonable language control; the students should be able to apply their knowledge to solve problems of medium complexity</p> <p>D Satisfactory 21-23 Discreto Average knowledge of the teaching contents is sometimes limited to the main topic; acceptable ability to use the specific discipline language and independently apply the acquired knowledge.</p> <p>E Sufficient 18-20 Sufficiente Minimum teaching content knowledge, often limited to the main topic; modest ability to use the subject-specific language and independently apply the acquired knowledge.</p> <p>F Fail Insufficient Lack of acceptable knowledge of the main teaching content knowledge; very little or no ability to use the specific subject language and apply independently the acquired knowledge.</p> <p>Compensatory tools and dispensatory measures will be guaranteed by the Disability and Neurodiversity Center - University of Palermo (Ce.N.Dis.) to students with disabilities and neurodiversity, based on specific needs and in the implementation of current legislation.</p>
TEACHING METHODS	Frontal lessons

<p>MODULE APPLIED BIOLOGY</p> <p><i>Prof.ssa CHIARA CORRADO</i></p>	
SUGGESTED BIBLIOGRAPHY	
<p>P. Bonaldo, C. Crisafulli, R. D'Angelo, M. Francolini, S. Grimaudo, C. Rinaldi, P. Riva, M.G. Romanelli "Elementi di Biologia e Genetica" EdiSES Editore, prima edizione. ISBN 9788833190389</p> <p>C. Donati, M. Stefani, N. Taddei "Biologia & Genetica" Zanichelli Editore, prima edizione. ISBN: 9788808520524</p>	
AMBIT	10338-Scienze biomediche
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30
EDUCATIONAL OBJECTIVES OF THE MODULE	
<p>Distinguish prokaryotic cells and eukaryotic cells. Identify the main biological structures, organization and fundamental biological processes of eukaryotic cells. Know the processes that regulate the flow of genetic information and the expression of genes in prokaryotes and eukaryotes. Analyze and compare genomic stability and variability. Main types of mutations. Analyze and compare the processes and methods of transmission of hereditary characteristics and the genotype-phenotype interactions. Heredity in the human species. Mode of transmission of Wilde Type and mutated genes.</p>	

SYLLABUS

Hrs	Frontal teaching
4	The cell: structural and functional organization. Differences between eukaryotic and prokaryotic cells. Biological membranes: organization and functional examples.
6	The flow of genetic information, from DNA to proteins. RNAs. The processes of transcription and translation.
4	Regulation of gene expression in eukaryotes.
2	Communications between the cell and the external environment. Signal transduction.
2	cell cycle
2	DNA replication
2	mitosis, meiosis and gametogenesis in the human species
4	Mendel's laws: dominance and recessiveness. The principle of segregation, independent assortment of the forms of two characters in the cross between di-hybrids. Extensions of Mendelian genetics: codominance, incomplete dominance, multiple alleles and polygenic traits.
4	Principles of human genetics: genotype and phenotype. Models of transmission of hereditary characteristics in the human species. Notes on hereditary metabolic diseases.

**MODULE
HUMAN PHYSIOLOGY**

Prof.ssa GIUSEPPA MUDO'

SUGGESTED BIBLIOGRAPHY

I testi sotto descritti sono indicativi. Qualsiasi testo di fisiologia e' ammesso per lo studio, purché sia sufficientemente chiaro nell'esposizione dei concetti e non renda lo studio particolarmente pesante per la prolissità degli argomenti trattati.

The books below are indicative. Any physiology book is admitted for study, provided it is sufficiently clear in the exposition of concepts and does not make the study particularly heavy for the proliferation of the topics discussed

Autori vari - Fisiologia umana. Fondamenti. Con e-book e espansione online. ISBN: 8870515443. I ediz. EdiErmes ed.
D.U Silverthorn - Fisiologia Umana- Un approccio integrato. VIII Ed. Pearson Italia. ISBN:9788891909732
Diego Manzoni, Eugenio Scarnati - Fisiologia orale e dell'apparato stomatognatico - I ediz. EdiErmes ed. ISBN: 8870512592

Saranno forniti agli studenti dispense specifiche agli obiettivi del corso. Sarà inoltre fornito materiale didattico in formato digitale per perfezionare lo studio sugli argomenti del corso.

Booklets will be provided to students, specific to the course objectives. It will also provide teaching material in digital format to improve the study on the course subjects.

AMBIT	10338-Scienze biomediche
INDIVIDUAL STUDY (Hrs)	60
COURSE ACTIVITY (Hrs)	40

EDUCATIONAL OBJECTIVES OF THE MODULE

The aim of the course is to put the student in the knowledge of the basics of the functioning of the main organs and apparatus of the human body, with particular attention to the stomatognathic system. Know how to respond to adaptive responses and the main mechanisms of integrated regulation of the various devices, with a focus on integrated control of the central nervous system and the organs involved in chewing and physiology of the teeth.

SYLLABUS

Hrs	Frontal teaching
2	General organization of physiological functions - Levels of integration of physiological functions (organs, tissues, cells). Concept of internal compartment . Water compartments of the body. Diffusion, passive and active transport of solutes and solvents. Membrane physiology Biological membranes. Dissemination through channels. Carrier-mediated transport. Active transport. Transepithelial transport. Endocytosis and exocytosis.
2	Physiology of the nervous system - Notions of neuronal excitability and action potential, synapses and neurotransmitters.
9	Sensory functions: Anatomic-functional organization of the SNC. General mechanisms of sensory receptors. Structure and mode of activation of skin receptors. Anatomical-functional organigram of tactile, thermal and painful sensitivity. Sensitive paths. Trigeminal sensitivity. Pain perception. Mechanisms of taste and smell. Gustative sensitivity: flavors, taste receptors, stimulation and transduction mechanisms, Olfactory sensitivity: olfactory receptors and pathways; the smells. Vegetative nervous system. Morpho-functional VNS organization. VNS neuromeditors. Vegetative reflexes and their central integration
6	Cell contractility. Functioning of sarcomere and contractile proteins. Coupling excitation-contraction in the striated muscle. Morpho-functional characteristics of smooth muscle. Coupling excitation-contraction in smooth muscle. Muscle-skeletal control. Mechanical aspects of contraction of skeletal muscles. Motor nuclei and force modulation. Physiological tetanus. Isometric and isotonic contractions. Proprioception. Stretching spinal reflexes. Flexor reflexes. Sovraspinous motor functions. Voluntary movements and their integration. Tendon and joint muscular proprioceptors: Muscle spindles, Golgi tendonic organs.
3	Physiology of digestive apparatus - Morpho-functional organization of digestive apparatus, gastric activity and its regulation. Small intestine, large intestine, pancreas and liver functions. Digestion, absorption and utilization of nutrients.
7	Physiology of the stomatognathic system. Structure of salivary glands. Salivation: Dynamic and composition of salivary secretion, salivary secretion regulation. Physiology of the chewing apparatus. Chewing: bone, joint, occlusal, muscular and nervous factors. Control of chewing, forces developed during chewing. Anatomy and physiology of swallowing: oral , pharyngeal and esophageal phases; Nerve control of swallowing.
3	Physiology of the kidney - Glomerular ultrafiltration. Tubular functions. Kidney controls of fluid and electrolyte balance, blood pressure and pH. Urination.

3	Cardiocirculatory system. Large and small circulatory system. Vascular function generalities. Heart cycle phases and valve movements. Pressory and volumetric variations in cardiac chambers and large arteries. Cardiac pacemaker and cardiac excitation propagation. Specific functions of arteries and arterioles. Capillary and vein functions. Blood Pressure control. Circulatory effects on orthostatism. and clinostatism . Blood: morpho-functional organization, formation and composition of plasma, morphology and functions of corpuscular constituents.
3	Respiratory systems: Respiratory Muscle. Pleural and dynamic pressure of the thoraco-lung system . Gas exchange in the alveoli and tissues. Transportation of gas in the blood. Upper respiratory tract. Control of respiratory function.
2	Physiology of mineralized tissues: ossification process; bone remodeling and repair of the. Calcium and phosphate metabolism and its adjustment. Hormone control of bone metabolism and body growth.