



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2022/2023		
BACHELOR'S DEGREE (BSC)	BIOTECHNOLOGIES		
INTEGRATED COURSE	PHYSIOLOGY - INTEGRATED COURSE		
CODE	03348		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	BIO/09		
HEAD PROFESSOR(S)	SERIO ROSA MARIA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	AMATO ANTONELLA	Professore Associato	Univ. di PALERMO
	SERIO ROSA MARIA	Professore Ordinario	Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	3		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>AMATO ANTONELLA Monday 14:30 16:00 Presso studio docente, stanza 506, Dpt STEBICEF Edificio 16-Viale delle Scienze, preferibilmente con conferma incontro via email: antonella.amato@unipa.it</p> <p>SERIO ROSA MARIA Tuesday 09:00 12:00 Studio Pt 072 Dipartimento STEBICEF. Ed. 16. Primo piano</p>		

DOCENTE: Prof.ssa ROSA MARIA SERIO

PREREQUISITES	Basic knowledge of cell biology, histology and biochemistry as acquired in the first and second year courses.
LEARNING OUTCOMES	<p>Knowledge and understanding Acquisition of knowledge concerning the basic mechanisms of the vital functions from the cell to the organ systems and the fundamental concepts in food and nutrition.</p> <p>Applying knowledge and understanding Ability to integrate the acquired knowledge for an interdisciplinary approach on the healthy life.</p> <p>Making judgments To make critically own skill judgment on the scientific issues proposed in classroom.</p> <p>Communication skills Ability to use the appropriate terms of the specific disciplines.</p> <p>learning skills Ability to deepen the topics covered in classroom in a largely autonomous manner, using own cultural heritage and / or scientific sources</p>
ASSESSMENT METHODS	<p>The final test consists of an oral examination. Student will be tested on one/two topics per module. The final mark will be calculated by the weighted average of the marks obtained in the module examinations, taking into account the number of credits assigned to each part. Final assessment aims to evaluate whether the Student has knowledge and understanding of the subjects, properties of language and is able to apply their knowledge to meet the object of the evaluation question. The assessment is carried out of 30 and the marks go from sufficient (18/30) to excellent (30/30 cum laude).</p> <p>The pass mark (18-20/30) will be reached when the student will have shown a minimal acceptable knowledge and understanding of the topics and presentation skills, but minimal ability to independently apply the knowledge gained. The demonstration of a greater knowledge of the topics together with a higher language skills and application of acquisitive knowledge will be proportionally evaluated more positively.</p> <p>The exam will be considered satisfactory (21-23/30) if the student demonstrates a basic knowledge of the subjects with language properties, but still poor ability to independently apply the knowledge gained.</p> <p>The exam will be considered good (24-26/30) if the student has a good command of the topics, good language skills, but still needs to be guided to apply the knowledge gained.</p> <p>The exam will be considered very good (27-29/30) if the student has a good command of the topics, very good language skills, and is able to independently apply the knowledge gained.</p> <p>The exam will be considered excellent (30-30 cum laude) if the student has an excellent knowledge of the topics, excellent language skills, and is able to independently apply the knowledge gained.</p>
TEACHING METHODS	In class lectures

**MODULE
PHYSIOLOGY OF NUTRITION**

Prof.ssa ANTONELLA AMATO

SUGGESTED BIBLIOGRAPHY

Alimentazione, nutrizione e salute. Debellis-Poli. Edises-ISBN 9788833190518

AMBIT	10643-Attività formative affini o integrative
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INDIVIDUAL STUDY (Hrs)	51
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COURSE ACTIVITY (Hrs)	24
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EDUCATIONAL OBJECTIVES OF THE MODULE

The course provides basic nutritional concepts and role of nutrition in health maintenance and diseases prevention. Particular attention will be paid to the study of food composition, the functions and the control mechanisms of the digestive system and the relations between nutrition and disease.

SYLLABUS

Hrs	Frontal teaching
3	Nutritional status : Anthropometric measurements. Requirement of Energy and Energy Expenditure: direct and indirect calorimetry.
12	Essential Nutrients - Carbohydrates, Lipids and proteins. Water and minerals. Vitamins. Composition and value of the main foods in the diet: Milk and derivatives, Meat, Eggs, Cereals and derivatives, Vegetables, Fruit, Oil and Fats.
6	Digestive Function: Digestive system anatomy. Mechanical and chemical digestion. Gastrointestinal motility; Gastrointestinal secretions: salivary secretion, gastric secretion, pancreatic secretion, biliary secretion and intestinal secretion. Control of secretion and motility. Digestion and Absorption of Carbohydrates, Lipids and proteins.
3	Nutritional requirements of a healthy diet: -Nutrition During Pregnancy and breast-feeding, Nutrition during Adulthood and Later Years, -Nutrition during Infancy and Adolescence, Nutrition and sport

**MODULE
GENERAL PHYSIOLOGY**

Prof.ssa ROSA MARIA SERIO

SUGGESTED BIBLIOGRAPHY

FISIOLOGIA UMANA. UN APPROCCIO INTEGRATO - Silverthorn. PEARSON EDUCATION ITALIA 2020 - ISBN: 9788891909732

FONDAMENTI DI FISIOLOGIA GENERALE E INTEGRATA - TAGLIETTI curatore - EDISES 2019 - ISBN:9788833190525

HUMAN PHYSIOLOGY: AN INTEGRATED APPROACH, - Silverthorn. PEARSON 2019 - ISBN:9780134704371

AMBIT	50078-Discipline biotecnologiche comuni
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INDIVIDUAL STUDY (Hrs)	102
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COURSE ACTIVITY (Hrs)	48
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EDUCATIONAL OBJECTIVES OF THE MODULE

The course aims to define the basic mechanisms of vital functions, providing students with the appropriate tools to be able to follow the progress of the study on the cellular functions.

SYLLABUS

Hrs	Frontal teaching
8	GENERAL CONCEPTS AND PRINCIPLES OF PHYSIOLOGY The regulation in the vital processes – The internal environment and its stability. The concept of homeostasis. Principles and homeostatic mechanisms - Integration systems (neural, endocrine and neuroendocrine messages). Exchanges between the cell and the environment. The membrane transports.
6	ELECTRIC PROPERTIES OF PLASMA MEMBRANE AND PHYSIOLOGY OF NEURONS Resting membrane potential. Ionic basis of resting membrane potential. Action potential: properties and ionic basis. Conduction of the Action Potential along the Nerve Fiber.
8	Chemical messengers and cellular responses - Local messengers - Hormones - Synaptic transmission. electrical and chemical synapses The neuromuscular transmission. Postsynaptic events. Mechanisms of Neurotransmitter Release. Synapses between neurons. Synaptic integration. Neurotransmitters. The sensory receptors. The reflex responses.
6	Skeletal Muscle. Molecular Mechanisms of skeletal muscle contraction. Whole-Muscle Contraction. Smooth and cardiac muscle.
10	CARDIOVASCULAR SYSTEM Structure and functions of the heart and circulatory system in vertebrates. Circulating body fluids: their composition and functions of plasma and blood cells. The heart as a pump . the Cardiac Cycle. The cardiac output and its regulation. Blood vessels and circulation: Hemodynamics: Physical Determinants of Blood Flow. Pressure & Flow in Arteries, Veins, and Capillaries. Diffusion Across the Capillary Wall: Exchanges of Nutrients and Metabolic End Products
4	RESPIRATORY SYSTEM Respiratory physiology: general principles, structure and functions of air passages and respiratory surfaces. Ventilation and gas Exchange Between Alveoli and Blood. Gas transport between the lungs and tissues. Gas Exchange Between Tissues and Blood
6	RENAL SYSTEM Osmolarity and osmotic pressure. Osmolarity vs tonicity. Osmosis. Body Fluid Compartments. Structure of the Kidneys and Urinary System. Basic Renal Processes: Glomerular ultrafiltration, reabsorption, secretion, excretion. Fluid and Electrolyte Balance