



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Biomedicina, Neuroscienze e Diagnostica avanzata		
<b>ACADEMIC YEAR</b>	2022/2023		
<b>BACHELOR'S DEGREE (BSC)</b>	NEUROPHYSIOPATHOLOGY TECHNIQUES		
<b>INTEGRATED COURSE</b>	HUMAN ANATOMY AND PHYSIOLOGY - INTEGRATED COURSE		
<b>CODE</b>	22356		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	3		
<b>SCIENTIFIC SECTOR(S)</b>	BIO/16, BIO/17, BIO/09		
<b>HEAD PROFESSOR(S)</b>	CAPPELLO FRANCESCO	Professore Ordinario	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	CAPPELLO FRANCESCO	Professore Ordinario	Univ. di PALERMO
	GAMBINO GIUDITTA	Ricercatore a tempo determinato	Univ. di PALERMO
	FUCARINO ALBERTO GIUSEPPE	Professore a contratto	Univ. di PALERMO
<b>CREDITS</b>	8		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	1		
<b>TERM (SEMESTER)</b>	1° semester		
<b>ATTENDANCE</b>	Mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<p><b>CAPPELLO FRANCESCO</b>  Monday 10:00 12:00 Plesso di Anatomia Umana ed Istologia, Dipartimento di Biomedicine, Neuroscienze e Diagnostica Avanzata.  Wednesday 10:00 12:00 Plesso di Anatomia Umana ed Istologia, Dipartimento di Biomedicine, Neuroscienze e Diagnostica Avanzata.</p> <p><b>FUCARINO ALBERTO GIUSEPPE</b>  Monday 09:00 13:00 Dipartimento Anatomia Umana Policlinico Palermo  Wednesday 09:00 13:00 Dipartimento Anatomia Umana Policlinico Palermo  Friday 09:00 13:00 Dipartimento Anatomia Umana Policlinico Palermo</p> <p><b>GAMBINO GIUDITTA</b>  Tuesday 10:30 12:30 Istituto di Fisiologia Umana, corso Tukory 129  Thursday 10:30 12:30 Istituto di Fisiologia Umana, corso Tukory 129</p>		

**DOCENTE:** Prof. FRANCESCO CAPPELLO

<b>PREREQUISITES</b>	Preliminary notions of Biology are required.
<b>LEARNING OUTCOMES</b>	<p>At the end of the course the student must be able to:</p> <ul style="list-style-type: none"><li>- Show that you have acquired the notions indicated in the transparency sheet for as regards both the modules of Histology and Physiology belonging to the Integrated Course</li><li>- Show understanding of cell and tissue morphology and physiology in terms of tissue processes and functions.</li><li>- Show autonomy in applying the notions learned and connecting them among them</li><li>- Be able to show autonomy of judgment regarding the arguments addressed</li><li>- Knowing how to transmit the notions learned and show mastery of the topics exposed</li><li>- Be able to learn the new knowledge that the progress of scientific research in the field of histology and neurophysiology implies.</li></ul>
<b>ASSESSMENT METHODS</b>	<p>Oral examination, aimed to ascertaining the acquisition of competence and knowledge on the module topics. Evaluation is expressed through a 30-point grading scale. The candidate will be asked a minimum of two questions, the first one on a wider subject, in order to verify the knowledge acquired, analytic skills, and possession of adequate expressive ability. However, in case of significant incompetency on fundamental topics by the examinee, the exam can be interrupted even after a single question. Grade: 30 - 30 Cum Laude Rating: EXCELLENT (ECTS grade A-A+ excellent) Outcome: excellent knowledge of the module content; the student shows outstanding analytic and synthetic abilities and is able to apply the acquired knowledge to solve extremely complex problems. Grade: 27 – 29 Rating: VERY GOOD (ECTS grade B very good) Outcome: very good knowledge of the module content and terminology; the student displays clear analytic and synthetic abilities and is able to apply the acquired knowledge to solve intermediate complex problems and, in certain cases, highly complex ones. Grade: 24 – 26 (ECTS grade C Good) Rating: GOOD Outcome: good knowledge of the module content and terminology; the student is able to apply the acquired knowledge to solve intermediate complex problems. Grade: 21 – 23 (ECTS grade D satisfactory) Rating: SATISFACTORY Outcome: satisfactory knowledge of the module content, in certain cases limited to the main topics; the student shows an acceptable degree of ability for using appropriate terminology and for independent application of the acquired knowledge. Grade: 18 – 20 (ECTS grade E sufficient) Rating: SUFFICIENT Outcome: minimal knowledge of the module content, often limited to the main topics; the student shows a moderate degree of ability for using appropriate terminology and for independent application of the acquired knowledge. Grade: 1- 17 Rating: INSUFFICIENT (EXAM FAILED) (ECTS grade F Fail) Outcome: the student does not possess an acceptable degree of knowledge on the main topics of the module; he/she shows very little or no ability for using appropriate terminology and for independent application of the acquired knowledge.</p>
<b>TEACHING METHODS</b>	Lectures.

## MODULE ANATOMY

Prof. ALBERTO GIUSEPPE FUCARINO

### SUGGESTED BIBLIOGRAPHY

SEELEY e VANPUTTE  
ANATOMIA UMANA con cenni di: Istologia – Fisiologia – Clinica 2018 5ta edizione ISBN8879477455  
Idelson Gnocchi

AMBIT	10338-Scienze biomediche
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

### EDUCATIONAL OBJECTIVES OF THE MODULE

The course has the following training objectives:  
acquisition of knowledge about the main characteristics of the human body;  
understanding and ability to use the language specific to this discipline;  
use of the acquired knowledge in order to study the different organs and systems, with particular reference to the anatomical study of the central and peripheral nervous system.  
Furthermore, at the end of the course, the student must have acquired the ability to evaluate the implications and results of studies aimed at clarifying the functioning of organs and systems. and to illustrate the concepts of Human Anatomy. He will also have to know the main morphofunctional characteristics of the human body systems, with particular regard to the structural aspects of the nervous system.

## SYLLABUS

Hrs	Frontal teaching
3	human anatomy introductory aspects
3	The skeletal system, the bone tissue; bone development and growth; classification and general characteristics of the bones. Skull and bones associated with the skull; the vertebral column; the rib cage; the thoracic girdle and the free part of the upper limb; the pelvic girdle and the free part of the lower limb; the joints.
3	Muscular tissue and skeletal muscles
3	Cardio-vascular system: Heart and organization of the large and small circulation
2	Respiratory system: upper and lower respiratory tract. Lungs and hematosi mechanism
2	digestive system: study of the various organs that make up the digestive system and the related organs
3	Urinary system: kidneys, ureters, bladder. Generalities on the male and female reproductive system
2	Endocrine system, general aspects
7	Nervous system organization and characteristics of the nervous tissue; the spinal cord and spinal nerves; the brain and cranial nerves; nerve pathways and higher functions; autonomic nervous system general sensitivity.
2	The sense organs and the related neural pathways

## MODULE HISTOLOGY

*Prof. FRANCESCO CAPPELLO*

### SUGGESTED BIBLIOGRAPHY

AAVV, Istologia per le lauree triennali e magistrali, Idelson Gnocchi, 2018, ISBN: 9788879476782

<b>AMBIT</b>	10338-Scienze biomediche
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<b>INDIVIDUAL STUDY (Hrs)</b>	30
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<b>COURSE ACTIVITY (Hrs)</b>	20
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### EDUCATIONAL OBJECTIVES OF THE MODULE

Knowledge relating to the bio-architecture of the cellular ecosystem, to the organization of the four main tissues; knowledge of the main systems of the human body with particular attention to the nervous system.

## SYLLABUS

Hrs	Frontal teaching
3	Generalities on the study of the cell and tissues, histological techniques, bio-architecture cell and stem cells.
3	Ultrastructure and morphofunctional aspects of the cell, the membrane-bound organelles, the cytoskeleton, the nucleus.
2	Epithelial tissues, general characteristics.
2	The connective tissues: general characteristics.
2	Muscle, skeletal, cardiac, smooth tissues. Morphofunctional aspects.
6	Nervous tissue, characteristics and classification of neurons.
2	Nervous tissue, characteristics and classification of glial cells.

## MODULE PHYSIOLOGY

*Prof.ssa GIUDITTA GAMBINO*

### SUGGESTED BIBLIOGRAPHY

FISIOLOGIA UMANA. UN APPROCCIO INTEGRATO - Silverthorn. PEARSON EDUCATION ITALIA 2017

<b>AMBIT</b>	10338-Scienze biomediche
<b>INDIVIDUAL STUDY (Hrs)</b>	45
<b>COURSE ACTIVITY (Hrs)</b>	30

### EDUCATIONAL OBJECTIVES OF THE MODULE

The course aims to provide the main concepts of human physiology, with emphasis on the nervous system and skeletal muscle.

## SYLLABUS

Hrs	Frontal teaching
4	CELLULAR ORGANIZATION OF LIVING THINGS AND HOMEOSTASIS. Regulation in life processes. The internal environment of the living and its regulation. The concept of homeostasis. Homeostatic principles and mechanisms. Exchanges between cell and environment. Membrane transports. Ion channels: biophysical, structural and functional properties.
4	ELECTRICAL PHENOMENA IN EXCITABLE CELLS AND COMMUNICATION BETWEEN CELLS. The resting membrane potential. Ionic genesis of the membrane potential. The action potential: properties and ionic basis. The conduction of the nerve impulse. Synaptic transmission. Electrical and chemical synapses. Neuromuscular transmission. Postsynaptic events. Chemical mediator release. The interneuronal synapses. Synaptic integration. Spatial and temporal summation. Neurotransmitters.
8	THE CENTRAL AND PERIPHERAL NERVOUS SYSTEM Anatomo-functional organization of the Central and Peripheral Nervous System. Functional organization of movement and perception. Sensory Coding. Principles of physiology of vision. Motor Units. Physiological principles of Electromyography, Electroneurography, Electroencephalography and Evoked Potentials
4	THE MUSCLE AND ITS CONTRACTION. Skeletal muscle: Contractile proteins and muscle contraction. Mechanics of muscle contraction. Isometric and isotonic contraction. Smooth and cardiac muscle.
2	THE CARDIOVASCULAR SYSTEM Functional organization of the cardiovascular system. Circulating fluids: the blood. Composition and functions The heart. Electrical and mechanical properties. The cardiac cycle. Regulation of cardiac activity. Principles of electrocardiography (ECG). Blood vessels and circulation.
2	THE RESPIRATORY SYSTEM External respiration. Respiratory gases and their diffusion: alveolar gas exchange- Respiratory gas transport-Tissue gas exchange.
2	THE DIGESTIVE SYSTEM The functions of the digestive system. General aspects of mechanical and chemical digestion of food. Intestinal absorption.
2	THE URINARY SYSTEM The function of the nephron: glomerular filtration, tubular reabsorption and secretion, excretion. The regulation of water and salt balance.
2	THE ENDOCRINE SYSTEM. Hormones. General principles of endocrine gland physiology and feedback control mechanisms.