



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
<b>ACADEMIC YEAR</b>	2017/2018		
<b>MASTER'S DEGREE (MSC)</b>	PHARMACEUTICAL CHEMISTRY AND TECHNOLOGIES		
<b>INTEGRATED COURSE</b>	GENERAL PHYSIOLOGY AND PATHOLOGY (MEDICAL TERMINOLOGY) - INTEGRATED COURSE		
<b>CODE</b>	13175		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	2		
<b>SCIENTIFIC SECTOR(S)</b>	BIO/09, MED/04		
<b>HEAD PROFESSOR(S)</b>	LA GUARDIA MAURIZIO	Professore a contratto in quiescenza	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	VASTO SONYA	Professore Associato	Univ. di PALERMO
	LA GUARDIA MAURIZIO	Professore a contratto in quiescenza	Univ. di PALERMO
<b>CREDITS</b>	14		
<b>PROPAEDEUTICAL SUBJECTS</b>	01286 - HUMAN ANATOMY 13167 - MATHEMATICS AND PHYSICS - INTEGRATED COURSE		
<b>MUTUALIZATION</b>			
<b>YEAR</b>	3		
<b>TERM (SEMESTER)</b>	1° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<p><b>LA GUARDIA MAURIZIO</b></p> <p>Monday 9:00 12:00 Viale delle Scienze, edificio 16</p> <p>Tuesday 9:00 12:00 Viale delle Scienze, edificio 16</p> <p>Thursday 9:00 12:00 Viale delle Scienze, edificio 16</p> <p><b>VASTO SONYA</b></p> <p>Monday 10:00 11:30 Dipartimento Stebicef, parco d'Orleans, Edificio 16, piano primo</p> <p>Wednesday 10:00 11:30 Dipartimento Stebicef, parco d'Orleans, Edificio 16, piano primo</p>		

**DOCENTE:** Prof. MAURIZIO LA GUARDIA

<b>PREREQUISITES</b>	Knowledge of Biochemistry concerning: a) the structure of the major organic compounds (proteins, carbohydrates, fats); b) the notion of "enzyme"; c) the possible mechanisms of regulation of the enzymes; d) the main metabolic processes.
<b>LEARNING OUTCOMES</b>	Knowledge and understanding ability: acquisition of advanced knowledge about the working of organs and systems, as target of the action of drugs. Capacity to understand the specific language of Physiology and Pathology. Capacity to apply knowledge and understanding: ability to use the acquired knowledge in order to study the mechanisms of action of drugs in the various organs and systems. Capacity to recognize and apply the cognitive tools and the methodological rigor of General Pathology for the rational exercise of any activity directly and indirectly connected to the protection of health. Independent judgment: to be able to evaluate the implications and results of investigations about the functioning of organs and systems. To be able to evaluate independently the results of studies about the pathogenetic mechanisms of diseases. Communication skills: ability to use the language of these disciplines to interact with other health professionals, but also to illustrate the concepts of General Physiology and Pathology to a non-expert audience. Learning skills: ability to upgrade examining the scientific publications in the field, in order to avoid the obsolescence of acquired knowledge. Ability to follow, using the knowledge acquired during the curricular course, or second level master, or seminars and advanced courses, in the field of General Physiology and Pathology.
<b>ASSESSMENT METHODS</b>	<p>Oral test for each of the two modules. The final score, expressed in thirtieth, will be from the average of the scores obtained in the two oral tests.</p> <p>The candidate must answer at least three questions orally asked, about all issues of the program, with reference to the suggested textbooks and provided teaching equipment. The exam aims to assess whether the student has knowledge and understanding of the topics, has interpretative competence and ability to establish connections between the topics of the course. The sufficiency is reached when the student shows knowledge and understanding of the subjects at least in general terms; also, must be able to explain and argue to convey his knowledge to the examiner. Below this threshold, the examination result insufficient. On the contrary, the more the student, arguing and explaining, is able to interact with the examiner, and his knowledge of the subject is detailed, the more the evaluation will be positive.</p> <p>30/30 cum laude. Excellent knowledge of the topics, excellent language skills, good analytical capacity; the student is able to apply knowledge to solve posed problems.</p> <p>26/29. Good mastery of the subjects, full language skills; the student is able to apply knowledge to solve posed problems.</p> <p>24/25. Basic knowledge of the main topics, moderate language skills; the student has a limited ability to apply knowledge to solve posed problems.</p> <p>21/23. The student does not have full mastery of the main topics, but he has adequate knowledge; the property language is satisfactory; the student has a poor ability to apply knowledge to solve posed problems.</p> <p>18/20. Minimal basic knowledge of the main topics and technical language; very little or no ability to apply knowledge to solve posed problems.</p> <p>Insufficient. He does not have an acceptable knowledge of the contents of the topics.</p>
<b>TEACHING METHODS</b>	Classroom lessons

**MODULE  
GENERAL PHYSIOLOGY**

*Prof. MAURIZIO LA GUARDIA*

**SUGGESTED BIBLIOGRAPHY**

Carbone E, Cicirata F, Aicardi G: "Fisiologia – dalle molecole ai sistemi integrati" – Ed. EdiSES Materiale didattico (files delle lezioni inserite nel portale)

<b>AMBIT</b>	50325-Discipline Biologiche
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<b>INDIVIDUAL STUDY (Hrs)</b>	140
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<b>COURSE ACTIVITY (Hrs)</b>	60
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**EDUCATIONAL OBJECTIVES OF THE MODULE**

The student will address the study of various organs and systems, considering their functioning key mechanisms, emphasizing above all the arguments of General Physiology more useful for the study of Pharmacology, and in any case, for knowledge must possess a graduate in Chemistry and Pharmaceutical Technology

**SYLLABUS**

Hrs	Frontal teaching
1	Functions of living being. Organization of tissues. The body's systems
3	Blood physiology: generality; The plasma; Red blood cells; White blood cells; Platelets and hemostasis
13	Nervous system physiology: introduction; Cell excitability; Excitability and conductivity of nerve fibers; Synapses; Sensory systems and receptors; The somatosensory system; The visual system; The vestibular system; The olfactory system; The tasting system; Reflexes; Brain motor cortex; The cerebellum; The basal ganglia; The vegetative nervous system; Functions of the hypothalamus; The cerebral cortex; Emotions; the electroencephalogram; the sleep
3	Muscle tissue: skeletal muscle tissue; smooth muscle tissue
9	Endocrine system and reproduction: General information; hypothalamus, pituitary gland, pineal gland; the thyroid; metabolism of calcium and phosphorus; the adrenal cortex; the endocrine pancreas; sexual reproduction
10	Cardiovascular system. Heart: General information; electrical activity; mechanical activity; Regulation of cardiac activity. Circulation: General information; the arteries; arterioles; the capillaries; the veins; the vasomotility. Control of the cardiovascular system. The coronary circulation. The pulmonary circulation
6	Respiratory system: General information; respiratory mechanics; gas exchange; Regulation of respiration
5	Excretory apparatus: General information and functional organization; Glomerular filtration; proximal tubule functions; functions of the loop of Henle; distal tubule functions; functions of collecting ducts. The body fluids. Endocrine functions of the kidney. Urination and urine
3	Physiology of energy metabolism: General information; the energy of food; energy expenditure
7	Digestive system: General information; gastrointestinal hormones; Digestive Motility; Salivary secretion; gastric secretion; Gastric motility; liver functions; biliary tract; Exocrine pancreatic secretion; intestinal secretion; small bowel motility; digestion and absorption of nutrients; functions of the large intestine

## MODULE PATHOLOGY (MEDICAL TERMINOLOGY)

*Prof.ssa SONYA VASTO*

### SUGGESTED BIBLIOGRAPHY

C. Caruso, F. Licastro. Compendio di Patologia generale. Casa Editrice Ambrosiana. 2006.  
Materiale didattico (dia e pdf distribuiti a lezione)

<b>AMBIT</b>	50321-Discipline Mediche
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<b>INDIVIDUAL STUDY (Hrs)</b>	105
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<b>COURSE ACTIVITY (Hrs)</b>	45
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### EDUCATIONAL OBJECTIVES OF THE MODULE

Knowledge and understanding capacity: acquisition of advanced knowledge about organs and systems as possible target of drugs. Capacity to understand the specific language of Physiology and Pathology.

Capacity to apply knowledge and understanding: ability to use the acquired knowledge in order to study the mechanisms of action of drugs in different organs and systems. Capacity to apply the methodological tool of General Pathology to understand and assess the items connected to health care and wellness.

Independent judgment: to be able to evaluate the implications and the results of research on organs and systems activity. To be able to independently evaluate the results of studies on the pathogenesis of diseases.

Communication skills: ability to use the proper terms and language to work with other health professionals, but also to communicate to non-expert audience notions of General Physiology and Pathology.

Learning skills: ability to acquire information by scientific publications, in order to be up to date in the scientific field. Ability to follow second level master, or seminars and advanced courses, in the field of General Physiology and Pathology.

## SYLLABUS

Hrs	Frontal teaching
3	Etiology, pathogenesis and pathophysiology : the anatomical and functional bases of diseases . Homeostasis , functional reserve and failure . cellular responses to harmful stimuli . Cellular damage ; causes and mechanisms ; subcellular response to injury ; intracellular accumulation and pathological calcification
6	The natural and specific immune response : cells and tissues of innate immunity . The importance of the barriers . The receptors of the innate immunity . General information on the inflammatory response : the inflammatory cells . Leukocytes : genesis , morphology and pathophysiology of lymphocytes , monocytes , neutrophils , eosinophils and basophils . The preparation of blood smears on slides . The differential count and its variations : normal values of individual populations , pathogenetic mechanisms of changes and pathophysiological significance . Structure and classes of antibodies . LPS and other types of inflammatory damages : the triggering mechanisms of inflammation The Angiophlogosis, vascular changes . The cellular mediators and fluid phase The inflammation cells ; the adhesion molecules and cell migration ; phagocytosis . Exudates and transudate ; classification of edema . The healing process : the tissue repair and wound healing . The histoflogosis: specific and granulomatous . Etiology of granulomas
4	Complement : activation through the classical pathway , activation via the alternative pathway , activation via the lectin away , Le anaphylatoxins ; The control mechanisms of the complement system ; Deficiency of complement molecules . The blood groups : The ABO system , the Rh system; Maternal-fetal incompatibility ; The HLA system. HLA and diseases . The Lymphocytes : The ontogeny of lymphocytes , lymphocyte classes , T lymphocytes , natural killer lymphocytes , B lymphocytes ; Phases of the immune response .
6	Serum electrophoresis and pathophysiology of serum proteins . The albumin and globulins . The acute phase proteins . Role in the monitoring of inflammatory processes ; VES, blood diseases and coagulation . Hypertension
4	Fever and other central effects of acute phase responses : hypothalamic effects of cytokines . Pathophysiology of body temperature and hyperthermia. Pyrogens and cryogenic . Types of fever and meaning
4	Anatomy and functions of primary and secondary lymphoid organs . General characteristics of the cytokines . Classification of cytokines . Cytokines that regulate innate immunity and inflammatory immune. Cytokines that regulate specific immunity . Hematopoietic cytokines . Cytokines that regulate cell migration ( chemokines ) . Chemotaxis and adhesion molecules General characteristics of the antigens ; Recognition of antigens ; Recognition of antigens by lymphocytes . Structure and functions of antibodies . Recognition of antigens by T lymphocytes
4	The type I hypersensitivity : allergens , IgE antibodies , mast cells and basophils , the mediators of hypersensitivity reaction type I ; predisposition to allergies . Hypersensitivity type II . The Type III hypersensitivity . The type IV hypersensitivity . immunological tolerance mechanisms . Autoimmunity : etiology and pathogenesis ; autoimmune diseases, organ and non- organ specific

4	The cell cycle : cell cycle control . cellular responses to harmful stimuli . Atrophy, hyperplasia , hypertrophy and metaplasia . General characteristics of cancer cells . The concept of cancer . benign and malignant tumors . Classification of tumors . Staging of tumors . Epidemiology of human cancers . Metastasis . metastatic diffusion mode : Dissemination through the blood , lymph , transcelomatica , subarachnoid , canalicular . tumor markers ;. protein markers : CEA ( carcinoembryonic antigen) , CA 19-9 , Alpha - fetoprotein ( AFP ) , chorionic gonadotropin , CA 125 263, prostate specific antigen ( PSA ) , carcinogens and carcinogenesis . chemical carcinogenesis . physical carcinogenesis . biological carcinogenesis : DNA tumor viruses , oncogenes Virus RNA.
4	Oncogenes and tumor suppressor genes ; Oncogenes : History , Functions of proto - oncogenes , growth factors and receptors , cytoplasmic and nuclear components along the way of the signaling cell , genes involved in the control of apoptosis and cell cycle , mutations that convert proto - oncogenes to oncogenes , Structure of oncogenes . Tumor suppressor genes : The Rb gene, p53 gene, other tumor suppressor genes , Importance of tumor suppressor genes in human disease
6	Endocrine disorders: goitre , hyperthyroidism , hypothyroidism ( Hashimoto , Graves , Graves ) thyroid cancer , goiter , dwarfism. Diabetes mellitus : Adrenal : Cushing's disease, non-inflammatory edema , Kidney diseases : nephrology syndromes , erectile dysfunction Cardiovascular diseases : atherosclerosis , ischemia , heart failure , stroke, Anemias gastric diseases : ulcers , celiac disease Genetic disorders: alpha 1-antitrypsin deficiency , familial Mediterranean fever, Hemochromatosis BPCO Rheumatoid arthritis, myasthenia gravis