



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2017/2018		
BACHELOR'S DEGREE (BSC)	BIOTECHNOLOGIES		
INTEGRATED COURSE	PHYSIOLOGY AND IMMUNOLOGY - INTEGRATED COURSE		
CODE	15239		
MODULES	Yes		
NUMBER OF MODULES	3		
SCIENTIFIC SECTOR(S)	BIO/09, MED/04		
HEAD PROFESSOR(S)	SERIO ROSA MARIA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	BALDASSANO SARA	Professore Associato	Univ. di PALERMO
	CACCAMO NADIA	Professore Ordinario	Univ. di PALERMO
	ROSALIA		
	SERIO ROSA MARIA	Professore Ordinario	Univ. di PALERMO
CREDITS	12		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	3		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>BALDASSANO SARA Saturday 0:00 1:00 SI RICEVE TUTTI I GIORNI PER APPUNTAMENTO da concordare con il docente via email. Studio n 507, Dip. STEBICEF, viale delle Scienze, Ed. 16, piano 1 o via teams- codice canale emzcza3.</p> <p>CACCAMO NADIA ROSALIA Tuesday 9:00 12:00 Dipartimento Bi.N.D., Corso Tukory 211. Il docente riceve per appuntamento previo contatto per email con un certo anticipo.</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, biochemistry and microbiology acquired in the first and second year courses.
LEARNING OUTCOMES	<p>Knowledge and understanding</p> <p>Acquisition of knowledge concerning the basic mechanisms of the vital functions from the cell to the organ systems , of the immune response in the defense against infectious agents and the fundamental concepts in food and nutrition.</p> <p>Applying knowledge and understanding</p> <p>Ability to integrate the acquired knowledge for an interdisciplinary approach on the healthy life.</p> <p>Making judgments</p> <p>To make critically own skill judgment on the scientific issues proposed in classroom.</p> <p>Communication skills</p> <p>Ability to use the appropriate terms of the specific disciplines.</p> <p>learning skills</p> <p>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.. The 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 questions . The pass mark will be reached when the student will have shown an 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 assessment is carried out of 30 and the marks go from sufficient (18/30) to excellent (30/30 cum laude).</p>
TEACHING METHODS	In class lectures

MODULE IMMUNOLOGY

Prof.ssa NADIA ROSALIA CACCAMO

SUGGESTED BIBLIOGRAPHY

- Janeway's Immunobiology di: Kenneth Murphy, Casey Weaver Editore: Garland Science Edizione: 9, 2016
 -Roitt's Essential Immunology di: Peter J. Delves, Ivan M. Roitt, Seamus J. Martin, Dennis R. Burton
 Editore: John Wiley & Sons Inc Edizione: 13, 2016
 - Immunologia cellulare e molecolare, Autori: Abbas, Lichtman, Pillai VIII edizione, 2015 Elsevier Masson–
 Review e articoli scientifici forniti dal docente.

AMBIT	10643-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	51
COURSE ACTIVITY (Hrs)	24

EDUCATIONAL OBJECTIVES OF THE MODULE

The aims of the module are to provide an understanding of core immunology and the immunological basis of some common diseases. The students, at the end of the course, should understand the cellular and molecular mechanisms of the immune response and their role in defense against infectious agents in the pathogenesis of immune-mediated reactions.

SYLLABUS

Hrs	Frontal teaching
6	Properties and Overview of Immune Responses. Cells and Tissues of the Immune System: cells and their receptors. Complement system activation, function, receptors and complement regulatory proteins . Phagocytosis, dendritic cells and antigen presentation, Major Histocompatibility Complex.
4	Antibodies and antigens: structure and functions. Fc receptors. Cytokines, chemokines and their receptors.
6	T lymphocytes: Lymphocyte Development and their activation and differentiation. Functions of CD4+ Effector T Cells, Functions of CD8+ Effector T Cells and DN T cells. Mechanism of apoptosis.
2	B Cell Activation and Antibody Production: Effector Mechanisms of Humoral Immunity.
4	Natural killer cells, gamma delta T lymphocytes, NKT cells: antigen recognition and effector functions. Immunologic Tolerance.
2	Laboratory techniques commonly used in immunology.

MODULE GENERAL PHYSIOLOGY

Prof.ssa ROSA MARIA SERIO

SUGGESTED BIBLIOGRAPHY

FISIOLOGIA UMANA. UN APPROCCIO INTEGRATO - Silverthorn. PEARSON EDUCATION ITALIA 2017
FISIOLOGIA - Monticelli – II ed. AMBROSIANA 2014

AMBIT	50078-Discipline biotecnologiche comuni
INDIVIDUAL STUDY (Hrs)	102
COURSE ACTIVITY (Hrs)	48

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 evolution of the study of the cellular functions.

SYLLABUS

Hrs	Frontal teaching
6	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.
12	Chemical messengers and cellular responses - Local messengers - Hormones - Synaptic transmission. electrical and chemical synapsesThe 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.
8	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

MODULE PHYSIOLOGY OF NUTRITION

Prof.ssa SARA BALDASSANO

SUGGESTED BIBLIOGRAPHY

ALIMENTAZIONE E NUTRIZIONE UMANA-Mariani Costantini, Cannella, Tomassi; Il pensiero Scientifico Editore - 2016
PRINCIPI DI NUTRIZIONE. Biagi, Di Giulio, Fiorilli, Lorenzini, Casa Editrice Ambrosiana- 2010
FISIOLOGIA UMANA: UN APPROCCIO INTEGRATO - Silverthorn. PEARSON EDUCATION ITALIA 2017

AMBIT	10643-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	51
COURSE ACTIVITY (Hrs)	24

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
8	Nutritional status in the community- Body composition. Evaluation of nutritional status: Biochemical and Anthropometric measurements. Requirement of Energy: Basal Metabolic Rate, metabolism during activity. Evaluation of Energy Intake: direct and indirect methods of calculation.
8	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.
5	Digestive Function: Digestive system anatomy. Mechanical and chemical digestion. Gastrointestinal motility: Mastication, swallowing, gastric motility, peristaltic movements. 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. Absorption of water and salts. Absorption of vitamins.
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