



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2018/2019		
BACHELOR'S DEGREE (BSC)	BIOTECHNOLOGIES		
INTEGRATED COURSE	CLINICAL PATHOLOGY - INTEGRATED COURSE		
CODE	09748		
MODULES	Yes		
NUMBER OF MODULES	3		
SCIENTIFIC SECTOR(S)	BIO/12, MED/05, MED/09		
HEAD PROFESSOR(S)	TUTTOLOMONDO ANTONINO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	BALISTRERI CARMELA RITA	Professore Associato	Univ. di PALERMO
	TUTTOLOMONDO ANTONINO	Professore Ordinario	Univ. di PALERMO
	BIVONA GIULIA	Professore Associato	Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	3		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>BALISTRERI CARMELA RITA Wednesday 10:00 12:00 Istituto di Patologia generale, Corso Tukory 211</p> <p>BIVONA GIULIA Wednesday 15:30 16:30 Dipartimento di Biopatologia e Biotecnologie Mediche, Sezione di Biochimica Clinica.</p> <p>TUTTOLOMONDO ANTONINO Friday 11:00 12:00 ex istituto di Clinica Medica, Piazza delle Cliniche n. 2, secondo piano(per informazioni rivolgersi al punto giallo in portineria)</p>		

DOCENTE: Prof. ANTONINO TUTTOLOMONDO

PREREQUISITES	The student will know the biochemistry and physiology of major organ systems that make up the human body and know the pathophysiology of major diseases.
LEARNING OUTCOMES	<p>Knowledge and understanding: Acquiring the basic knowledge of the disciplines, through lectures and personal study of texts and scientific publications, and the ability to use the specific language of these disciplines. Knowing the molecular, cellular, biochemical and physiological involved both in the body's homeostasis and diseases. Understanding the main laboratory tests and their correlations with the human diseases. This knowledge will be acquired through lectures and theoretical-practical activities and, it will be verify through tests in ongoing oral and/or written examinations. Applying knowledge and understanding: Demonstrating the ability to apply the acquired knowledge and understanding through the use of diagnostic strategies, performed with biotechnologies of the field of Clinical Pathology, and even based on both knowledge acquired in clinical pathophysiology (Human Pathology) and choose and use of appropriate equipment and biomolecular methods, identifying individual problems, advantages and limitations. These skills will be assessed through theoretical and practical exercises. Making judgments: Being able to assess the implications of biotechnological choices of the disciplines and the results obtained, by considering the data of the international bibliography. Communication skills: Being able to describe in an appropriate and suitable manner to the other health care professionals a critical interpretation of the obtained results of laboratory tests. Being able to describe to other health care professionals the presence of a laboratory result and its complications. Learning skills: Consolidating the knowledge of Biochemical, Clinic, and Human. Being able to deepen the study of laboratory tests for the diagnosis of diseases in order to perform a continuous and regular updating of scientific knowledge progressively in developing. Being able to perform a literature research, in order to correctly and periodically update the scientific knowledge. Acquiring the ability to improve the knowledge with Masters of Science of the I and II level. Knowing the application and limitations of biomedicine biotechnology</p>
ASSESSMENT METHODS	<p>The learning assessment consists in itinere evaluations and an oral examination. Oral examination consists in a conversation, order to check competences and subject knowledge required from the course; the evaluation is expressed in thirtieths.</p> <p>The questions will tend to test the learning achieved by assessing a) the knowledge captured; b) the processing capacity, c) possession of adequate exhibition capacityThe pass mark will be reached when the student shows knowledge and understanding of the issues at least in general terms, and has minimal application knowledge in order to solve concrete cases; the student will also have presentation skills and of argument as to allow the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient. A sufficient grade in each module is necessary to pass the final exam. If the mark is insufficient in any of the modules, the student cannot pass the final examination.</p>
TEACHING METHODS	The didactic activity takes place through lectures.

**MODULE
HUMAN PATHOLOGY**

Prof. ANTONINO TUTTOLOMONDO

SUGGESTED BIBLIOGRAPHY

Manuale di Medicina Interna Sistematica, a cura di C. Rugarli, Masson editore
Manuale didattico in forma di diapositive fornito dal docente

AMBIT	10643-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	47
COURSE ACTIVITY (Hrs)	28

EDUCATIONAL OBJECTIVES OF THE MODULE

Knowledge of the pathophysiology and clinic symptomatology of major internal diseases so as to allow for a better understanding of the most important elements that are at the basis of pathological processes that develop in the evolutionary, adult and geriatric processes that can represent the basis of the research both basic and especially translational and therefore of biotechnology I interest

SYLLABUS

Hrs	Frontal teaching
2	pathophysiology of Atherosclerosis
2	inflammation and atherosclerosis: from macrophage to lymphocyte T within the atherosclerotic plaque ecology
2	Coronary artery disease: coronary plaque evolution and pathogenesis of myocardial infarction
2	ischemic stroke: epidemiology and clinical classification
2	diabetes: pathophysiology of type 2 and type 1 diabetes
2	Hypertension: pathogenesis and epidemiology
2	heart failure and neurohormonal cascade in its pathogenesis
2	acute renal failure: pathophysiology

MODULE CLINICAL PATHOLOGY

Prof.ssa CARMELA RITA BALISTRERI

SUGGESTED BIBLIOGRAPHY

Medicina di Laboratorio - M. Laposata - Ed. Piccin
 Manuale di Patologia Clinica – I. Antonozzi – Ed. Piccin
 Materiale didattico fornito dal docente
 Selezione di articoli della letteratura scientifica consigliati dal docente

AMBIT	10643-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	47
COURSE ACTIVITY (Hrs)	28

EDUCATIONAL OBJECTIVES OF THE MODULE

Objectives of the Clinical Pathology teaching: providing the students with cultural and technical basis of clinical pathology in order to allow them to know and learn the biotechnology methodologies, and consequently to use them for detecting useful parameters (i.e. biomarkers) for the prevention, diagnosis and treatment of diseases

SYLLABUS

Hrs	Frontal teaching
2	Knowledge about the basic diagnostic techniques and the organization of the Clinical Pathology Laboratory. Biomarkers and their biological, pre-analytical, analytical variability, and their applications in the functional assessment or as indicators of tissue damage and organ
3	Blood and its components, their functions. Counts of blood cells and their applications in the diagnosis laboratory of blood disorders, such as anemia. Alterations in leukocyte formula and their applications in immune disorders
3	Pathophysiology of autoimmune diseases, their classification and diagnostic criteria. Bio-markers and techniques in their laboratory diagnosis
3	Cardiovascular diseases and diagnostic laboratory
2	Molecular biomarkers and their applications in prenatal diagnostic laboratory, hereditary diseases and complex diseases
3	Molecular techniques in the diagnosis of genetic diseases
Hrs	Practice
4	Principles and Methods of flow-cytometry and their applications in the diagnostic laboratory of blood and immune disorders (immunodeficiency)
4	Immunoassays and indirect immunofluorescence methods and their applications in the diagnosis laboratory of autoimmune diseases
4	Application of diagnostic methods (real time PCR, ARMS, PCR-FRLP, FRET-PCR, sequencing) of molecular biology in clinical pathology

MODULE CLINICAL BIOCHEMISTRY

Prof.ssa GIULIA BIVONA

SUGGESTED BIBLIOGRAPHY

M. Ciaccio, G. Lippi. Biochimica Clinica e Medicina di Laboratorio. Edises, 2017.
I. Antonozzi, E. Gulletta. Medicina di Laboratorio Logica & Patologia Clinica. Piccin , 2012.
James D. Watson, M. Gilman, J. Witkowski, M. Zoller: DNA Ricombinante. 1a Edizione Italiana, Zanichelli, 2002.
L. Sacchetti, P. Cavalcanti, G. Fortunato, L. Pastore, F. Rossano, D. Salvatore e F. Scopacasa: Medicina di Laboratorio e Diagnostica Genetica. Idelson-Gnocchi Editori, 2007.

AMBIT	10643-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	47
COURSE ACTIVITY (Hrs)	28

EDUCATIONAL OBJECTIVES OF THE MODULE

Acquisition of basic and applied concepts of clinical biochemistry in order to evaluate methods and clinical applications of laboratory tests critically. Specific aim of the course is to be able to identify the correct tests in relation to clinical conditions of the patients and to be able to understand them in relation to the diagnosis.

Particularly, the students must:

- know the main laboratory tests and the biological, molecular and pathological basis for their use in medicine;
- interpret lab results with regard to the uncertainty of measurement and biological variability; evaluate the diagnostic accuracy of laboratory investigations.
- have information on the characteristics and limitations of the most important methods used in Clinical Biochemistry and Molecular Biology.

SYLLABUS

Hrs	Frontal teaching
4	Laboratory tests: definition, types, requests Pre-analytical phase: preparation of the patient, collection of biological samples, processing and identification of biological samples.
2	Analytical phase: the biochemical and clinical analytical process: general laboratory techniques. Post-analytical phase: data collection, calculation, automatic processing. Intervals and reference value. Sensitivity and specificity of test. Intra-individual and inter-individual biological variation.
4	Metabolism of lipids: Lipoprotein. Dyslipidemia. Hypercholesterolemia. Laboratory evaluation of the lipoprotein metabolism. Clinical Biochemistry of myocardial infarction. Diabetes: biochemistry of DMT1 and DMT2; biochemistry of diabetes complications
4	The metabolic functions of the liver. laboratory in liver diseases. Biochemistry of jaundice.
2	Clinical biochemistry of healthy and pathologic renal function . AKF and CKD. Tumor markers.
Hrs	Workshops
12	Extraction of DNA from biological sources (peripheral blood cells); electrophoresis of nucleic acids; restriction analysis of the DNA fragments. Restriction fragment length polymorphism analysis