



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Medicina di Precisione in area Medica, Chirurgica e Critica		
ACADEMIC YEAR	2023/2024		
MASTER'S DEGREE (MSC)	DENTISTRY		
INTEGRATED COURSE	BIOCHEMISTRY AND CLINICAL MOLECULAR BIOLOGY - INTEGRATED COURSE		
CODE	17142		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	BIO/10, BIO/12		
HEAD PROFESSOR(S)	SCAZZONE CONCETTA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)	SCAZZONE CONCETTA	Professore Associato	Univ. di PALERMO
	AGNELLO LUISA	Professore Associato	Univ. di PALERMO
CREDITS	8		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>AGNELLO LUISA</p> <p>Monday 10:00 12:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio, Dipartimento BIND, Via del Vespro 129</p> <p>Wednesday 10:00 12:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio, Dipartimento BIND, Via del Vespro 129</p> <p>SCAZZONE CONCETTA</p> <p>Monday 12:00 15:00 Istituto di Biochimica , via del Vespro 129, 90127 Palermo</p>		

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>Midterm exams and Oral assessment. This assessment is used to evaluate the student's knowledge and understanding of the programme content, independent judgement, ability to apply acquired knowledge and specific technical terminology. The student will have to answer a minimum of four questions posed orally which will focus on the subjects covered in the programme, making reference to suggested texts.</p> <p>The assessment grades are given as numerical scores awarded out of a possible 30 points, and as follows:</p> <p>- 30 - 30 cum laude - ECTS grades: Excellent (A – A+) Result: Excellent knowledge of the taught subject matter. The student demonstrates good analytic-synthetic capabilities and is able to apply knowledge to resolve highly complex problems.</p> <p>- 27 – 29 – ECTS grades: Very good (B) Result: Very good knowledge of the taught subject matter and good use of language. The student demonstrates analytic-synthetic capabilities and is able to apply knowledge to resolve some complex problems.</p> <p>- 24 – 26 – ECTS grades: Good (C) Result: Good knowledge of the taught subject matter and good use of language. The student is able to apply knowledge to resolve problems of medium complexity.</p> <p>- 21 – 23 – ECTS grades: Satisfactory (D) Result: Reasonable knowledge of the taught subject matter, in some cases limited to the main topics. Acceptable use of technical language and capacity to apply acquired knowledge independently.</p> <p>- 18 – 20 – ECTS grades: Sufficient (E) Result: Minimal knowledge of the taught subject matter, often limited to the main topics. Modest use of technical language and some capacity to apply acquired knowledge independently.</p> <p>- 1 – 17 – ECTS grades: Fail (F) Result: Unacceptable knowledge of the taught subject matter. Little or no use of technical language and capacity to apply acquired knowledge independently. Exam failed.</p>
TEACHING METHODS	The didactic activity takes place through lectures.

MODULE BIOCHEMISTRY

Prof.ssa CONCETTA SCAZZONE

SUGGESTED BIBLIOGRAPHY

Biochimica Medica" di Siliprandi. Tettamanti, Ed. Piccin. ISBN 978-88-299-2791-3

Biochimica – Devlin-Idelson Gnocchi. ISBN 8879475142

AMBIT	50450-Struttura, funzione e metabolismo delle molecole d'interesse biologico
INDIVIDUAL STUDY (Hrs)	75
COURSE ACTIVITY (Hrs)	50

EDUCATIONAL OBJECTIVES OF THE MODULE

The aim of the course is: the knowledge of biological molecules; the acquisition of basic knowledge of biochemistry, the enzymatic mechanisms and their regulation; the learning of the biochemical and molecular processes that characterize the main metabolic pathways.

SYLLABUS

Hrs	Frontal teaching
2	Introduction to metabolism. ATP, NAD/NADH, NADP/NADPH.
3	Enzymes: Properties. Mechanism of Action. Regulation of Activity. Inhibitors.
2	Carbohydrate. Classification: Monosaccharides, disaccharides and polisaccharides.
4	Carbohydrates metabolism: assimilation, degradation – Glycolysis reactions and regulation. Galactose, Mannose and Fructose metabolism.
3	Pyruvate destiny. Gluconeogenesis. Cori's cycle
2	Glycogen metabolism.
4	The tricarboxylic acid cycle, reactions and metabolic regulation. The Pentose Phosphate Pathway.
2	Oxidative phosphorylation. Mitochondrial electron transport chain complexes, Malate/aspartate shuttle, Glycerol 3-phosphate shuttle.
2	Fatty acids structures – Triacylglycerols – Glycerolphospholipids – Sphingolipids. Arachidonic acid derivatives (prostaglandins, leukotrienes, thromboxans). Terpens. Steroids.
4	Lipid metabolism. Fatty acid activation & transport . Fatty acid β -Oxidation. Lipoproteins.
2	Ketone bodies
3	Cholesterol metabolism
4	The destiny of amino group of aminoacids: structure and function of transaminases. Glucose/alanine cycle. Urea cycle.
2	Catabolism EME
4	Hormones: general features, functions, biological effects.
4	Signal Transduction.
3	Vitamins: general features, functions, biological effects.

MODULE
CLINICAL BIOCHEMISTRY AND CLINICAL MOLECULAR BIOLOGY

Prof.ssa LUISA AGNELLO

SUGGESTED BIBLIOGRAPHY

Ciaccio M. Trattato di Biochimica Clinica e Medicina di Laboratorio. Edises 2021.

AMBIT	50446- Diagnostica di laboratorio
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

The student will have to acquire the methodological and cultural bases, as well as the ability to use the clinical biochemical data as a diagnostic tool.

Specific objectives of the module are to acquire the knowledge of the main laboratory tests and the biological, molecular and pathophysiological bases of the disease; to use laboratory tests correctly in screening, diagnosis and diseases monitoring; appropriate interpretation of results and their critical correlation with pathophysiological events.

SYLLABUS

Hrs	Frontal teaching
2	Laboratory tests: definition, types, requests.
2	Pre-analytical phase: preparation of the patient, collection of biological samples, processing and identification of biological samples. General laboratory techniques with descriptions of the principles. Post-analytical phase: data collection, calculation, automatic processing. Analytical variation, analytical error, quality control systems. Intra-individual and inter-individual biological variation, reference values, nomenclature and reporting of laboratory tests. Clinical sensitivity and specificity, predictive laboratory tests.
4	Metabolism of lipids. Characteristics of lipoprotein. Primary and secondary dyslipidemia. Metabolic syndrome
3	Myocardial infarction: risk factors, biochemical modification in the necrotic area; clinical enzymes, new markers of myocardial infarction. Heart failure: definition, biochemical-clinical alterations, diagnosis and role of circulating biomarkers
5	Metabolism of glucose: Diabetes: biochemistry of DMT1 and DMT2; biochemistry of diabetes complications; clinical biochemistry diagnostics Hypoglycemia: clinical biochemistry
3	Clinical Biochemistry of Liver Diseases. Bilirubin metabolism and clinical biochemistry diagnosis of jaundice.
2	Clinical-biochemistry of Kidney Diseases
2	Celiac disease: from definition to pathogenesis, to diagnostic algorithms in symptomatic and asymptomatic patients.
2	Calcium and Vitamin D metabolism. Diagnostic algorithm of hyper- and hypocalcemia
3	Metabolism of thyroid hormones. Clinical biochemistry of hyperthyroidism, thyrotoxicosis and hypothyroidism.
2	Tumor biomarkers and their clinical use.