



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche		
ACADEMIC YEAR	2024/2025		
MASTER'S DEGREE (MSC)	MOLECULAR AND HEALTH BIOLOGY		
SUBJECT	ADVANCED BIOCHEMISTRY		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50507-Discipline del settore biomolecolare		
CODE	15454		
SCIENTIFIC SECTOR(S)	BIO/10		
HEAD PROFESSOR(S)	DE BLASIO ANNA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	98		
COURSE ACTIVITY (Hrs)	52		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	DE BLASIO ANNA Monday 14:00 16:00 Dipartimento STEBICEF, ed. 16 viale delle Scienze, Palermo Tuesday 13:00 14:00 Aula Teams "ricevimento studenti" link di accesso: https://teams.microsoft.com/channel/19%3a960f6e49ef91459b83d5f0dae1c43718%40thread.tacvGenerale?groupId=7981a70a-4c99-4814-883f-721b8bac75b6&tenantId Thursday 12:00 13:00 Ingegneria Biomedica-Sede di Caltanissetta (via Real Maestranza) Friday 10:00 11:00 Dipartimento FISICA E CHIMICA, aula AP4, ed. 18 viale delle Scienze, Palermo		

DOCENTE: Prof.ssa ANNA DE BLASIO

PREREQUISITES	To fully understand the content and meet the objectives of the course, the student will have property of basic knowledge of Biochemistry. In detail: structure and function of proteins; protein folding; mode of action and regulatory mechanisms of enzymes; signal transduction mechanisms; main metabolic pathways and hormonal control; metabolic interrelationships of major tissues and organs.
LEARNING OUTCOMES	<p>Knowledge and understanding The student will acquire knowledge about molecular mechanisms of human health, biochemical mechanisms regulating the principal metabolic pathways (glucose, lipid and protein) and cellular metabolic specializations (hepatocytes, erythrocytes, muscle cells). He will also understand the related pathologies.</p> <p>Knowledge and understanding ability The student will acquire the ability to evaluate the variations of clinical chemical parameters related to human pathologies.</p> <p>Judgment skill The student will have ability to critical and competent learning of the discipline contents, to propose new topics and to establish connections among the arguments.</p> <p>Enable to communicate The student will be able to report specific biochemical arguments with a properly language.</p> <p>Learning skills Students will be addressed in the autonomous search for scientific information using properly scientific sources.</p>
ASSESSMENT METHODS	<p>The exam is an oral test.</p> <p>The test consists of an interview, in order to assess the expected student learning of the outcomes for the course. The exam consists of a minimum of three questions, including a topic chosen by the student. Additional secondary questions, will help to assess: the rational and critical learning content. Exam topics will be related to the course program. Will be evaluated: the capacity of exposure and use of an appropriate scientific language; the ability to synthesis and to establish connections between topics; having studied some topics and the ability understanding of scientific texts; knowledge of clinical and related health issues with the subjects of the discipline.</p> <p>The evaluation is expressed in thirtieths.</p> <p>The final evaluation will consist of the maximum score (30/30) if the student demonstrates that he has the capacity previously described (competence on the covered topics, descriptive capacity; language proficiency; ability to establish connections, deepening of the study). The student who demonstrates to know the basic content of the discipline and to relate with appropriate language will get a minimum assessment (18/30).</p> <p>An "in itinere" evaluations will be carry out during the course and will allow the student to self-assess their learning status and highlight any gaps to be filled with the teacher.</p> <p>Compensatory tools and dispensatory measures will be guaranteed by the Disability and Neurodiversity Center - University of Palermo (Ce.N.Dis.) to students with disabilities and neurodiversity, based on specific needs and in implementation of current legislation.</p>
EDUCATIONAL OBJECTIVES	The course " Advanced Biochemistry " aims to broaden and deepen their knowledge on the biochemical mechanisms that govern major metabolic processes of the human organism and its pathological changes, taking into account the most recent advances acquired by basic and clinical research. This knowledge will provide the basis for the training of experts in the field of clinical biochemistry, useful to monitor the human health.
TEACHING METHODS	<p>Frontal lessons (5 CFU)</p> <p>Laboratory Exercises (1 CFU)</p> <p>Innovative teaching methods using 'Student-centered' methods.</p>
SUGGESTED BIBLIOGRAPHY	<p>Maccarrone M. Fondamenti di biochimica umana. Zanichelli. I edizione ISBN: 8808420191</p> <p>Nelson & Cox. I Principi Di Biochimica Di Lenhinger. Zanichelli. VI edizione ISBN: 8808723283</p> <p>Appling Cahill Mathews. Biochimica-Molecole e metabolismo.Pearson. ISBN: 8891902748</p> <p>Siliprandi Tettamanti. Biochimica Medica. V edizione. Piccin. ISBN: 8829927910</p> <p>Marks. Biochimica Medica. Ambrosiana. II edizione ISBN: 8808182177</p> <p>Monografie e lavori scientifici suggeriti nel corso delle lezioni.</p>

SYLLABUS

Hrs	Frontal teaching
1	Course presentation and objectives analysis

SYLLABUS

Hrs	Frontal teaching
8	Advances on the knowledge of the metabolic processes: carbohydrate, lipids, proteins and nitrogen bases metabolism. The main metabolic diseases (diabetes, atherosclerosis and obesity). New diagnostic methods and therapeutic perspectives .
3	Metabolic hormones: signaling, synthesis and release; cells and tissues target; physiological responses and pathological changes.
4	Liver functional biochemistry. Clinical parameters of liver functions.
8	Metabolic specializations of the cell: the skeletal and cardiac muscle cells; the erythrocyte; the nerve cell; immunity cells; cellule della linea the cancer cell; the stem cell cancer; cancer.
6	Biochemistry of blood proteins. The coagulation cascade. The iron homeostasis .
2	Special topics: biochemistry of inflammation and immunity; autoimmune diseases. ROS and RNS, oxidative stress and scavengers enzymes. Endoplasmic reticulum stress and UPR: implications for human health.
4	Protein folding and misfolding diseases
2	Clinical Biochemistry and Molecular Diagnostics: theoretical/practical aspects of diagnostic and therapeutic techniques.
2	In itinere tests for student self-assessment
Hrs	Workshops
12	Main biochemical methods used in research and in clinical approach: protein assays; SDS-PAGE; western blot; immunofluorescence.