



General information	
Academic subject	MEDICAL APPLIED BIOCHEMISTRY
Degree course	Pharmacy
Year of study	III
European Credit Transfer and Accumulation System (ECTS)	6
Language	Italian
Academic Year	2022-2023
Academic calendar (starting and ending date)	FEBRUARY 2023- JUNE 2023
Attendance	Obligatory

Professor/ Lecturer Course A-E	
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Virtual headquarters	Microsoft teams
Tutoring (time and day)	Every day on appointment by email

Professor/ Lecturer Course F-N	
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Tutoring (time and day)	Monday-Friday, by appointment

Professor/ Lecturer Course O-Z	
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Virtual headquarters	Microsoft teams
Tutoring (time and day)	Monday and Friday from 16 to 18 on appointment by email

Syllabus	
Learning Objectives	Acquisition of advanced knowledge of the fundamental principles that regulate the metabolism of some tissues and organs in physiopathological conditions. Study of the most recent biochemical and biomolecular methodologies aimed at clinical diagnostics and to produce biopharmaceutical molecules
Course prerequisites	Knowledge of biochemistry
Contents	Metabolic interrelationships. Fasting feeding cycle. Hormonal control. Insulin and Glucagon: biosynthesis, secretion, signal transduction, metabolic effects. Counter-regulatory hormones: catecholamines. Thyroid hormones: biosynthesis and metabolic effects. Glycemia. Hypoglycemia. Type 1 diabetes. Type 2 diabetes: pathogenesis, metabolic effects. Diagnosis and drug therapy of diabetes. Chetonic bodies. Glycogenosis.



	<p>Organ biochemistry. Hepatic metabolism: Haem catabolism. Jaundice. Liver function test.</p> <p>Hereditary metabolic diseases. Aminoacidurias. Nitrogen metabolism. Muscle tissue metabolism.</p> <p>Lipoproteins and cholesterol; Hypercholesterolemia. Plasma lipids and lipoproteins. Determination of total cholesterol, HDL, LDL. Triglyceride determination.</p> <p>Biochemical markers of myocardial infarction.</p> <p>The blood. Blood cells. Hematopoiesis. Complete blood count. Blood proteins. Hemoglobinopathies: Thalassemia.</p> <p>Biochemical methodologies. Elements of clinical biochemistry and self-analysis tests. Restriction enzymes. Molecular cloning. Vectors. Plasmids. PCR. PCR applications. Operon LAC. Constitutional and inducible expression systems. Expression and purification of recombinant proteins. Recombinant drugs. Production of recombinant insulins. Monoclonal antibodies. Chimeric and humanized antibodies. Antibodies for anti-tumor immunotherapy. Vaccines.</p>
Books and bibliography	<ul style="list-style-type: none"> • Biochimica per le discipline biomediche. Authors: Baynes John W., Dominiczak Marek H. – Ed. Elsevier • Biochimica medica, strutturale, metabolica e funzionale. Authors: Siliprandi, Tettamanti - Ed. Piccin • Biochimica applicata. Authors: Stoppini, Bellotti - Ed. Edises
Additional materials	Students should integrate their study with lecture notes and biochemistry textbooks. PowerPoint slides projected during the lessons are available.

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	60		90
ECTS			
6	6		
Teaching strategy		Lectures with the use of PowerPoint, networking and writing on the board	
Expected learning outcomes			
Knowledge and understanding on:		<ul style="list-style-type: none"> ○ Basic principles underlying the metabolism of some tissues and organs in physio-pathological conditions. ○ Metabolic interrelationships among various tissues and organs ○ biochemistry and biomolecular techniques, with applications to clinical biochemistry 	
Applying knowledge and understanding on:		<ul style="list-style-type: none"> ○ Application of a broad spectrum of biochemical methodologies for the evaluation of metabolic alterations ○ Application of methodologies aimed at the production of biopharmaceuticals 	
Soft skills		<ul style="list-style-type: none"> • <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> ○ Acquisition of autonomy concerning the evaluation and interpretation of experimental and clinical data in relation to metabolic dysfunctions • <i>Communicating knowledge and understanding</i> 	



	<ul style="list-style-type: none">○ Acquisition of the most appropriate lexicon and terminology in order to be able to understand and communicate clearly the contents of the discipline● <i>Capacities to continue learning.</i><ul style="list-style-type: none">○ Acquisition of skills that favor the development, deepening and constant updating of knowledge inherent to the discipline, with particular reference to the consultation of bibliographic material, databases and other online contents.
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Assessment and feedback	
Methods of assessment	Oral interview on topics of the course. Since the course refers to biochemical reactions and metabolic patterns, the use of writing is also required where appropriate.
Evaluation criteria	<ul style="list-style-type: none">● <i>Knowledge and understanding</i><ul style="list-style-type: none">○ The critical acquisition of the contents of the lessons will be evaluated.● <i>Applying knowledge and understanding</i><ul style="list-style-type: none">○ The ability to integrate the knowledge learned in the course with those of related disciplines delivered in previous years will be assessed.● <i>Autonomy of judgment</i><ul style="list-style-type: none">○ The student's ability to not stop at the notion will be assessed but to grasp the meaning of the disciplinary contents so that the study becomes an opportunity to increase the knowledge and culture of medical and clinical biochemistry.● <i>Communicating knowledge and understanding</i><ul style="list-style-type: none">○ Ability to describe the medical and applied biochemistry using the appropriate terminology will be assessed.● <i>Communication skills</i><ul style="list-style-type: none">○ The property of language and the clarity of the exposition will be evaluated.● <i>Capacities to continue learning.</i><ul style="list-style-type: none">○ The ability to deepen the knowledge of the course autonomously, by consulting bibliographic material, databases, and other online contents, will be assessed.
Criteria for assessment and attribution of the final mark	The knowledge of the main contents of the academic subject and the ability to communicate them using an appropriate terminology will be evaluated. Furthermore, transversal skills will be considered. To achieve a high evaluation, the student must show adequate argumentation and presentation skills.
Additional information	