

Study programme	MEDICAL STUDIES IN ENGLISH				
Cycle	INTEGRATED	Type	UNIVERSITY		
Study track	-	Module	-		
Year of study	2	Semester	III		
Course title	MEDICAL CHEMISTRY AND BIOCHEMISTRY II	Course code	MFMSE301		
ECTS	8	Status	OBLIGATORY		
Teaching hours		Lectures	Exercises	Seminars	Practice
		42	34	34	0
Teachers	dr. sc. Ivanka Mikulić, izv. prof.	20		6	
	dr. sc. Darija Pašalić, prof.	10		6	
	dr. sc. Vinka Mikulić, doc.	12	6	6	
	Kristina Ljubić, v. asist.		8	8	
	Ana Ćuk, v. asist.		8	8	
	Ivona Cvetković, asist.		6		
	Ante Pušić, asist.		6		
Course objectives	<ul style="list-style-type: none"> - To achieve students' understanding of the functioning of the organism at the molecular level, which is reflected in the normal function of the organs as well as in the pathological biochemical processes in the organism. - To achieve students' understanding of the role of natural biomolecules in the body. - To achieve students' understanding of the dynamics of synthesis and degradation of natural biomolecules: proteins, carbohydrates, lipids and nucleic acids. - To achieve students' understanding of the influence of hormones on the function of the main organ systems. 				
Course learning outcomes	Learning outcome (LO) Student:		Course learning outcome code	LO code at the study program level	
	Describes and presents the role of biomolecules in the human body.		IU-MFMSE301-1	IU-MSE2	
	Describes and explains the mechanisms of synthesis and degradation of natural macromolecules: proteins, carbohydrates, lipids and nucleic acids.		IU-MFMSE301-2	IU-MSE3	
	Explains the principles of regulation and control of cellular metabolism, using biochemical and metabolic arguments to explain physiological and pathophysiological processes.		IU-MFMSE301-3	IU-MSE3	
	Draws the structure of biomolecules.		IU-MFMSE301-4	IU-MSE1	
	Calculates the number of moles of ATP that are generated/consumed in the metabolism of natural macromolecules.		IU-MFMSE301-5	IU-MSE3	
	Calculates the charge of a polypeptide at a given pH.		IU-MFMSE301-6	IU-MSE1	
Prerequisites for the course enrolment	In accordance with the Rulebook on the Integrated Studies at the School of Medicine University of Mostar.				
Course content	Week / shift	Topic			
	Lectures:	(L1) The Conformation and Dynamics of Protein Structure (L2) Proteins with Special Functions: Hemoglobin, Myoglobin (L3) Proteins with Special Functions: Collagen, Elastin (L4) Proteins with Special Functions: Actin, Myosin (L5) Plasma Proteins and Immunoglobulins (L6) Vitamins: role and function (L7) Coenzyme; Bioenergetics: The role of ATP			

	(L8) Enzyme catalysis (L9) Metabolism of Nucleotides (L10) Nucleic Acid Structure & Function (L11) DNA Organization, Replication & Repair (L12) RNA Synthesis, Processing & Modification; Protein Synthesis & the Genetic Code (L13) Regulation of Gene Expression (L14) Molecular Genetics, Recombinant DNA & Genomic Technology (L15) Metabolism of Xenobiotics, Pharmacogenetics (L16) Glycolysis (L17) Glycogen: Synthesis and degradation (L18) Gluconeogenesis, Cori cycle (L19) The Pentose Phosphate Pathway, Fructose, Galactose (L20) Oxidative decarboxylation, Citric acid cycle (L21) The Respiratory Chain & Oxidative phosphorylation (L22) Lipids of Physiologic Significance; Cholesterol Synthesis, Transport & Excretion (L23) Lipid Transport & Storage (L24) Oxidation of Fatty Acids: Ketogenesis (L25) The Diversity of the Endocrine System (L26) Urea Cycle, Metabolism of Amino Acids (L27) Free Radicals & Antioxidant Nutrients (L28) Overview of Metabolism & the Provision of Metabolic Fuels						
	Seminars: At the seminars, students will solve some tasks about specific topics. They will make presentations about seminar topic given by teacher.						
	Exercises: (E1) Qualitative detection of protein (E2) Serum protein electrophoresis (E3) Ionization properties of amino acids (E4) Enzyme kinetics (E5) Monosaccharides and polysaccharides determination (E6) Lipids (E7) Acid-base and mineral status in organism (E8) Qualitative urine analysis (E9) Creatinine Clearance (E10) Human DNA isolation						
Language	English						
E-learning	Classes are taken in person. If necessary, lectures, seminars and part of the exercises can take place combined (live and online) or completely online via e-learning platforms (Google Meet) up to max 20%.						
Teaching methods	Teaching, interactive and active-experiential.						
Types of assessment (indicate - Bold)							
Type of pre-examination obligation					Type of exam		
midterm	seminar paper	essay/report	practical/project task	other	written exam	oral exam	practical
Allocation of ECTS credits and share in the grade							
Student obligations		Learning outcome code	Hours of workload	Share in ECTS	Share in grade		
Attending classes			110	3.7	0%		
Seminar			10	0.3	0%		
Midterm/Colloquium of exercises		IU-MFMSE301-1 IU-MFMSE301-6	15	0.5	0%		
Pre-exam/Written exam		IU-MFMSE301-1 IU-MFMSE301-2 IU-MFMSE301-3 IU-MFMSE301-4 IU-MFMSE301-5 IU-MFMSE301-6	105	3.5	100%		
In total			240	8	100%		
Method of calculating the final grade							

The final grade is based on the written exam. A detailed description is provided in additional information about the case.											
Literature (indicate)	Title (title, author, year)	Edition		Language				Type of literature			
		own	other	croatian	english	other	multilingual	book	article	script	other
Compulsory	Harper's Illustrated Biochemistry 31st Edition; V. Rodwell, D. Bender, K. Botham, P. Kennelly, PA. Weil; 2018.		x		x			x			
	Biochemistry,9th Edition, Berg JM, Tymoczko JL, Gatto Jr. GJ,Stryer L., 2019.		x		x			x			
	Medical chemistry and biochemistry exercises handbook for medical students, I. Mikulić, N. Jelić Knezović, V. Mikulić, K. Landeka, A.Ćuk., 2014.	x			x					x	
Additional	Lehninger principles of biochemistry 8th Edition, DL. Nelson and MM. Cox, 2021.		x		x			x			
	Scientific papers for seminars,different authors		x		x					x	
	teaching materials		x		x						x
Additional course information											
<p>As it is a basic course in a specific field of biochemistry, in addition to theoretical classes, by processing selected different seminar topics and solving tasks, the student further expands his knowledge and can demonstrate the ability to think critically and recognize the essential elements of a certain educational issue.</p> <p>The course in medical chemistry and biochemistry II. contains 110 hours and takes over 5 weeks, which also includes a post-class examination period (pre-exam).</p> <p>Classes consist of lectures, seminars and exercises.</p> <p>In order to take the exam, the student is required to fulfill all the other following obligations: attend classes regularly, prepare and present a seminar essay on the given topic, do exercises in the practical part of the class, support them with an appropriate report, and pass the final colloquium.</p> <p>To pass the pre-exam/written exam (grade sufficient) and to participate in the oral exam, a student has to answer 55% of the questions correctly.</p> <p>According to the Rulebook on studying at the University of Mostar, grades are assigned as follows:</p> <p>0-54% insufficient (1); 55-66% sufficient (2); 67-78% good (3); 79- 90% (very good 4); 91-100% excellent (5).</p>											