

DEPARTMENT FOR MEDICAL CHEMISTRY AND BIOCHEMISTRY

(Performance plan – hours: academic year **2023/2024.**)

Head of department: Prof. Ivanka Mikulić, PhD

UNIVERSITY OF MOSTAR SCHOOL OF MEDICINE		INTEGRATED UNIVERSITY STUDY	
SOURCE:	Medical Biochemistry		
Year: II	Semester:	III	
Course Level:	Basic Level	ECTS Points: 9	
Course Status:	Class form: total 110 hours (L+S+P:42+34+34)		

Signature Requirements: Regular attendance of lectures, seminars, exercises

Examination method: colloquia, written exam, oral exam

Consultation terms: by agreement

Scheduled lessons: 03.10.2023. – 04.11 2023.

Teachers: Associate professor Ivanka Mikulić

Professor Darija Pašalić

Assistant professor Vinka Mikulić, ,

Assistant professor Ana Ćuk,

Assistent, Ante Pušić

Assistent, Ivona Cvetković

MSE – Classroom for Medical Studies in English

Date/Day/ Time	Theme	L S E	Group	Teacher/ associate	Classroom
October 3th. 2023. (Tuesday) 13,30-15,00	The Conformation and Dynamics of Protein Structure	L1	A	Ivanka Mikulić	MSE
15,15-16,45	Proteins with Special Functions: Hemoglobin, Myoglobin	L2	A	IM	MSE

October 4th. 2023.(Wednesday) 13,30-15,00 15,15-16,00 16,00 – 17,30	Proteins with Special Functions: Collagen, Elastin	L3	A	IM	MSE
	Vitamins: role and function	L4	A	IM	MSE
	Seminars	S	A	IM	MSE
October 5th. 2023.(Thursday) 13,30-15,00 15,15-16,00 16,00 – 17,30	Coenzyme; Bioenergetics : The role of ATP	L5	A	IM	MSE
	Enzyme catalysis	L6	A	IM	MSE
	Seminars	S	A	IM	MSE
October 6th. 2023. (Friday) 13,30-15,00 15,15-16,00 16,00 – 17,30	Plasma proteins and immunoglobulins	L7	A	Vinka Mikulić	MSE
	Metabolism of Nucleotides;	L8	A	Ana Ćuk	MSE
	Seminar processing of the previous material	S	A	AC	MSE
October 9th 2023. (Monday) 13,30-15,00 15,15-16,45 16,45 – 18,15	Nucleic Acid Structure & Function Replication, transcription, translation	L9	A	Ana Ćuk	MSE
	Seminar processing of the previous material	L10	A	AC	MSE
		S		AC	
October 10th 2023. (Tuesday) 13,30-15,00 15,15-16,00 16,00 – 17,30	Regulation of Gene Expression, Molecular diagnostics	L11	A	Ana Ćuk	MSE
	Metabolism of xenobiotics, pharmacogenetics	L12	A	Ana Ćuk	
	Seminar processing of the previous material	S	A	Ana Ćuk	
October 11th 2023. (Wednesday) 8,30 – 12,45 13,30-15,00 15,15-16,00 16,00 – 17,30	Biochemistry exercises Amino acid metabolism,,: urea cycle	E L13	A	AC (AP) Vinka Mikulić	CP MSE
	Proteins with special functions - actin, myosin	L14	A	Ivanka M	MSE
	Seminar processing of the previous material	S	A	IM	MSE

October 12th. 2023. (Thursday) 8,30 – 12,45 13,30-15,00 15,15-16,00 16,00 – 17,30	Biochemistry exercises Reactive oxygen compounds and antioxidants Glycolysis Seminar processing of the previous material	L15	A	AC (IC) IM	CP MSE
		L16	A	IM	MSE
		S	A	IM	MSE
October 13th 2023. (Friday) 8,30 – 12,45 13,30-15,00 15,15-16,00 16,00 – 17,30	Biochemistry exercises Pentose phosphate pathway, fructose and glucose metabolism Glycogen ; Synthesis and degradation Seminar processing of the previous material	E L17	A	AC (AP) Vinka	CP MSE
		L18	A	Mikulić IM	MSE
		S	A	IM	MSE
October 16th 2023. (Monday) 8,30 – 12,45 13,30-15,00 15,15-16,00 16,00 – 17,30	Biochemistry exercises Citric acid cycle The Respiratory Chain & Oxidative phosphorylation; Seminar processing of the previous material	E L19	A	AC (IC) Darija Pašalić	CP MSE MSE
		L20	A	DP	MSE
		S	A	DP	MSE
October 17th 2023. (Tuesday) 8,30 – 12,45 13,30-15,00 15,15-16,00 16,00 – 17,30	Biochemistry exercises Gluconeogenesis, Cori cycle Lipids of Physiologic Significance; Cholesterol Sythesis, Transport & Excretion Seminar processing of the previous material	E L21	A	Vinka M (AP)	CP MSE
		L22	A	DP	MSE
		S	A	DP	MSE
October 18st 2022. (Wednesday) 8,30 – 12,45 13,30-15,00 15,15-16,00 16,00 – 17,30	Biochemistry exercises Lipid Transport & Storage The Diversity of the Endocrine System Seminar processing of the previous	E L23	A	Vinka M (IC)	CP MSE
		L24	A	DP	MSE
		S	A	DP	MSE

	material			DP	
October 19th 2023. (Thursday) 12,30 h -	A Practical part of the output Colloquium		A	AC	CP
13,30-15,00	Oxidation of Fatty Acids: Ketogenesis	L25	A	VM	MSE
15,15-16,45	Overview of Metabolism & the Provision of Metabolic Fuels	L26	A	Ivanka Mikulić	MSE
16,45-18,15	Seminar processing of the previous material	S		IM	MSE
October 23th 2023. (Monday) 13,00-16,45	Seminars	S	A	IM	MSE
October 24th 2023. (Tuesday) 13,00-16,45	Seminars	S	A	Vinka Mikulić	MSE
November 02nd 2023. (Thursday) 09,00	Written exam				
November 03th 2023. (Friday)	Oral exam				

CP – Chemistry practicum
MBP- Microbiology practicum

Red colour marked– on line lectures and seminars

Biochemistry exercises

PREPARATION OF ACETILSALICIC ACID (ASPIRIN); QUALITATIVE DETECTION OF PROTEIN; PROTEIN ELECTROPHORESIS IN SERUM; IONIZATIONAL PROPERTIES OF POLYPROTIC PARTICLES; AMINOACIDS; ENZYME KINETICS; INQUIRED QUANTITATIVE IMUNCHEMICAL METHODS; DETECTING MONOSACCHARIDES AND POLYSACCHARIDES; LIPIDS DETERMINATION; ACID-BASE AND MINERAL STATUS IN ORGANISM; QUALITATIVE URINE ANALYSIS; DNA ANALYSIS

**The exact timing of group exercise exercises will be announced immediately before the exercise; the place of maintenance - chemical-biochemical practice and partly diagnostic laboratory SKB Mostar.*

The students will be informed about the time of the partial and final exam.

Literature (2023./2024.)

Required literature:

For the course Medical Biochemistry is necessary:

Medical chemistry and biochemistry exercises handbook for medical students, I. Mikulić, N. Jelić Knezović, V. Mikulić, K. Landeka, A.Čuk. Medicinski fakultet, Mostar 2014.

1. Murray RK, Bender DA, Botham KM, Kennelly PJ, Rodwell VW and Weil A.; Harper's Illustrated Biochemistry , 31ST EDITION, 2018.
2. Streyer L. Biochemistry, 6th ed. WH Freeman and Company, New York, 2011.

Optional literature:

1. Streyer L. Biochemistry, 5th ed. WH Freeman and Company, New York, 2001.
2. Michael Lieberman, Allan D. Marks, Colleen Smith: Mark'S Basic Medical Biochemistry , 2005

I. TOPICS OD LECTURES

a) The main learning guide is a CD of complete lectures from biochemistry.

b) According to required literature

The number of	Topics	Literature: Harper's Illustrated Biochemistry , 31ST EDITION, 2018.
L1	The Conformation and Dynamics of Protein Structure	Section I Chapter 3-5
L2	Proteins with Special Functions: Hemoglobin, Myoglobin	Section II Chapter 6
L3	Plasma Proteins and Immunoglobulins	Section X Chapter 52
L4	Proteins with Special Functions: Collagen, Elastin	Section X Chapter 50
L5	Proteins with Special Functions: Actin, Myosin	Section X Chapter 51
L6	Vitamins: role and function	Section IX Chapter 44
L7	<i>Coenzyme; Bioenergetics : The role of ATP</i>	Section III Chapter 11
L8	Enzyme catalysis	Section III Chapter 11,12
L9	The Pentose Phosphate Pathway, Fructose, Galactose	Section IV Chapter 20
L10	<i>Metabolism of Nucleotides; Nucleic</i>	

	<i>Acid Structure & Function</i>	
L11	DNA Organization, Replication & Repair	Section VII Chapter 35
L12	RNA Synthesis, Processing & Modification; Protein Synthesis & the Genetic Code	Section VII Chapter 36,37
L13	Regulation of Gene Expression	Section VII Chapter 38
L14	Molecular Genetics, Recombinant DNA & Genomic Technology	Section VII Chapter 39
L15	Metabolism of Xenobiotics, Pharmacogenetics	Section IX Chapter 47
L16	Metabolism of Amino Acids; Urea Cycle	Section VI Chapter 27-30
L17	Glycolysis	Section IV Chapter 15,17
L18	Glycogen : Synthesis and Degradation	Section IV Chapter 18
L19	Gluconeogenesis, Cori cycle	Section IV Chapter 19
L20	Citric acid cycle	Section IV Chapter 16
L21	The Respiratory Chain & Oxidative phosphorylation	Section III Chapter 12,13
L22	Lipids of Physiologic Significance; Cholesterol Synthesis, Transport & Excretion	Section V Chapter 21,26
L23	Lipid Transport & Storage	Section V Chapter 25
L24	The Diversity of the Endocrine System	Section VIII Chapter 41
L25	Oxidation of Fatty Acids: Ketogenesis	Section V Chapter 22
L26	Free Radicals & Antioxidant Nutrients	Section IX Chapter 45 Section XI Chapter 57
L27	Overview of Metabolism & the Provision of Metabolic Fuels	Section IV Chapter 14

SEMINARS

Solving tasks and issues after certain thematic units; individual presentations of the seminar work of the respective subject, of each individual student.

EXERCISES

Medical chemistry and biochemistry exercises handbook for medical students, I. Mikulić, N. Jelić Knezović, V. Mikulić, K. Landeka, A.Ćuk. Medicinski fakultet, Mostar 2014. - students need to study this material before starting the exercise. Exercises are held in chemico-biochemical practice and microbiological practice: partly in ZZLD SKB Mostar.

II. KNOWLEDGE TEST

Attending all forms of tuition is **REQUIRED**. Exceptional seminars are compensated by colloquy, and the absence from the exercise is compensated by examining the theoretical part of the exercise.

The students prepare the material in advance, which is checked during the seminars and exercises. Any minus received at a seminar, as well as absence of exercises, students are required to qualify for a knowledge check.

After completing all forms of instruction, the student receives a signature, which is a condition for accessing the exam from Medical Chemistry and Biochemistry.

Students have the opportunity to get a maximum of 5 points in the exams and exercises, which are added only to the first written exam of biochemistry.

The exam will be taken in both forms : written and oral.

Students who achieve a minimum of 55% points on written exams can go to the oral exam.

For passage (on the final exam or the regular exam period) the student must achieve 55% or more points on the written exam. The unique grade of the exam will determine the number of points on a written seminar, indicated by oral exam and activity during all forms of teaching.