

# SYLLABUS

for the education cycle starting in the academic year 2022/2023

<b>Name of a course / module</b>	<b>BIOCHEMISTRY</b>	
<b>Name of a department where course is held</b>	Department of Medical Biochemistry	
<b>E-mail of department</b>	zdbioch@umb.edu.pl	
<b>Faculty of</b>	Medicine with Division of Dentistry and Division of Medical Education in English	
<b>Name of a field of study</b>	medical	
<b>Level of education</b>	Uniform master's degree studies	
<b>Form of study</b>	full time <input checked="" type="checkbox"/>	part time <input type="checkbox"/>
<b>Language of instruction</b>	Polish <input type="checkbox"/>	English <input checked="" type="checkbox"/>
<b>Type of course</b>	obligatory <input checked="" type="checkbox"/>	facultative <input type="checkbox"/>
<b>Year of study / Semester</b>	I <input checked="" type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI <input type="checkbox"/>	1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/> 12 <input type="checkbox"/>
<b>Introductory courses with preliminary requirements</b>	getting credit according to recruitment procedure	
<b>Number of didactic hours with specification of forms of conducting classes</b>	lecture – 50 hours seminars – 20 hours classes – 75 hours	
<b>Assumptions and aims of the course</b>	To familiarize students with the molecular structure and metabolism of the human body in health and disease. Visualize biochemical knowledge, useful in the further study of medical science. Preparing graduates to study learning in the course of their working lives.	
<b>Didactic methods</b>	providing knowledge in a form of a lecture laboratory classes, periodic checks	
<b>Full name of the person conducting the course</b>	employed scientific and teaching staff of Department of Medical Biochemistry	
<b>Full name of the person responsible for teaching</b>	dr hab. Lech Romanowicz	

Symbol and number of learning outcomes according to the teaching standards and other learning outcomes	Description of directional learning outcomes	Form of classes	Verification methods for achieving intended learning outcomes
<b>Knowledge</b>			
B.W10.	the structure of simple organic compounds making up macromolecules, found in cells, extracellular matrix and fluids;	lectures	<u>Summarizing methods</u> written exam  <u>Forming methods</u> - observation of the student's work - assessment of preparation for classes - partial test
B.W11.	describe the structure of lipid and polysaccharide, their intracellular and extracellular functions;	lectures	
B.W12.	specification of primary, secondary, tertiary and quaternary structure of protein; post-translational modifications and functional modifications of protein and their significance;	lectures	
B.W13.	nucleotides' functions in the cell, primary and secondary structure of DNA and RNA and the structure of chromatin;	lectures	
B.W15.	describe basic anabolic and catabolic pathways; ways of their regulation and effects of environmental and genetic factors;	lectures	

B.W16.	metabolic profiles of basic organs and systems;	lectures	
<b>Skills</b>			
B.U4.	calculating the solubility of inorganic compounds; determining presence or absence;	classes	<u>Summarizing methods</u> realization of a specific task  <u>Forming methods</u> - observation of the student's work - evaluation of the activity in the classroom - completion of each activity - assessment of preparation for classes - discussion in class
B.U5.	defining pH of the solution and impact of pH modification on organic and inorganic compounds;	classes	
B.U6.	forecasting biochemical processes, depending on cell energy;	classes	
B.U8.	using basic laboratory techniques, such as: qualitative analysis, titration, colorimetry, pHmetry, chromatography, electrophoresis of proteins and nucleic acids;	classes	
B.U9.	using fundamental laboratory techniques, such as qualitative analysis, titration, colorimetry, pH-metry, chromatography, electrophoresis of proteins and nucleic acids;	classes	
<b>Social competence</b>			
K4	be aware of his/her own limitations and need to improve their skills continually	classes	<u>Summarizing methods</u> - continuous assessment by teachers  <u>Forming methods</u> - observation of the student's work - discussion in class
K7	use objective sources of information		
K8	formulate conclusions from his/her own measurements or observations		
K10	formulate opinions on various aspects of professional activity		

<b>ECTS points</b>	14
<b>Student Workload</b>	
<b>Form of activity</b>	<b>Number of hours to complete the activity</b>
<b>Classes that require the participation of a teacher</b>	
1. Realization of the course: lectures (according to the study plan)	50
2. Realization of the course: classes (according to the study plan)	75
3. Realization of the course: seminars; (according to the study plan)	20
4. Realization of the course: electives	
5. Participation in consultation	10
	Total hours: 155
<b>Student self-study</b>	
1. Preparation for the theoretical and practical classes (realization of projects, documentation, case description etc.)	70
2. Preparation for tests/credits	70
3. Preparation for an exam/final test-credit	60
	Total hours: 200

<b>Course contents:</b>	
<b>Learning outcomes (symbol and number)</b>	<b>Topics</b>

B.W10.	Amino acids, peptides, proteins, Extracellular matrix, Blood biochemistry, Enzymology, Porphyrines
B.W11.	Lipids, plasma lipoproteins, polysaccharides
B.W12.	Amino acids, peptides, proteins, protein synthesis
B.W13.	Nucleic acids - molecular biology principles
B.W15.	Glycolysis, oxidative decarboxylation of pyruvate, Kreb's cycle, gluconeogenesis and pentose phosphate pathway, glycogen metabolism,
B.W16.	Protein and amino acid metabolism, Hormones, Cytokines, eicosanoids, vitamins, macronutrients and micronutrients, Metabolism of ethanol, Transport through biological membranes, Integration and regulation of metabolism
B.U5, B.U6, B.U9, B.U10	Specific energy metabolism Bioenergetics, active forms of oxygen Amino acids and proteins, Properties of proteins in solutions Blood proteins, Nucleic acids, Phospholipids, steroids and carotenoids, Enzymes, Enzymes of digestive tract, Maximal velocity and Michaelis constant of enzymatic reaction, Enzyme activity, Competitive and noncompetitive inhibition of an enzyme, Detection of fructose 1,6-bisphosphate aldolase activity, Oxidative decarboxylation of pyruvate, Protein nitrogen, amino acid transamination, Catalase, Gel filtration, Glutaminase and its activity in kidney and skeletal muscle, Glucose consumption in brain, Glycogen synthesis and degradation, Biochemical calculations

**Obligatory textbook:**

Harper's Illustrated Biochemistry, Lange Medical Books/ McGraw-Hill, 2018  
Biochemistry workbook for students of the Faculty of Medicine and the Faculty of Health Sciences, UMB 2010

**Optional textbook:**

Marks' Basic Medical Biochemistry, Wolters Kluwer Health, 2017  
Ferrier DR: Lippincott Illustrated Reviews: Biochemistry, Wolters Kluwer 2017

**Criteria for assessing the achieved learning outcomes and the form and conditions for receiving credit:**

1. Classes are conducted in the form of lectures and laboratory exercises and four periodic written tests (open-ended questions to assess: satisfactory - 60% of points, good - 80% of points, very good - 95% of points available). Students who do not include a periodic check on the first date, they have the ability to "fix" the set time.
2. All classes are obligatory.
3. Due to the nature of the course (a series of weekly laboratory classes) there is no possibility of doing absence. Accepted a documented, excused absence (sick leave, dean's leave) one- on lectures and one- on exercises in the semester.
4. Any unjustified absence and another excused absence and failure in credit result in received by the Student points:
  - With the absence of the lecture student receives 0.5 points, and the absence of the class 1 point.
  - Failure in the second period of credit results in the receipt of 2 points.
5. Obtaining the student during the academic year 5 points and more result in non-admission to the examination session.
6. The final written exam covers the material of lectures, exercises and indicated for self-preparation. The exam is evaluated according to the scale: satisfactory - 60% of points , good - 80% of points , very good - 95% of possible points to obtain.

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(date and signature of the Head of the Department or course coordinator)