

SUBJECT/COURSE SYLLABUS

1.	Course name in Polish and English Structure and Function of Biomolecules Struktura i funkcja biomolekuł
2.	Scientific discipline Medical sciences Biotechnology
3.	Language of instruction English
4.	Unit conducting the course Faculty of Biotechnology
5.	Type of course compulsory
6.	Field of study Biotechnology
7.	Level of study first-cycle
8.	Year of study 1st
9.	Semester summer
10.	Course form and number of hours Lecture, 45 h
11.	Prerequisites in terms of knowledge, skills and social competences for the course: <ul style="list-style-type: none">• none
12.	Learning objectives for the course: To provide students with a comprehensive understanding of the structure and biological functions of proteins, carbohydrates, lipids, and nucleotides.
13.	Curriculum content: <ul style="list-style-type: none">• Molecular bases of life.• Water in biological systems.• Amino acids and proteins: amino acid properties, protein structures, and biological function of hemoglobin, collagen, motor and cytoskeletal protein.

	<ul style="list-style-type: none"> • Methods for protein analysis. • Enzymology: mechanisms of enzyme action and regulation of enzymatic activity. • Biological membranes, membrane proteins structure and function. • Structure and function of lipids: storage, membrane, and signaling lipids. • Structure and function of carbohydrates: monosaccharides, disaccharides storage and structural polysaccharides, proteoglycans, and glycoproteins. • Nucleotides and nucleic acids: structure, properties, and biological roles. 	
14.	<p>Description of learning outcomes</p> <p>Student:</p> <ul style="list-style-type: none"> • explains the physicochemical properties of water and their importance for the stability of biological structures; • describes the chemical structure and classification of amino acids, carbohydrates, lipids, and nucleotides; • characterizes the levels of protein organization and relates protein structure to specific biological functions; • describes the mechanisms of enzyme catalysis and the factors influencing the kinetics and regulation of enzymatic reactions; • identifies the components and architecture of biological membranes and their role in cellular compartmentalization; • describes the relationship between the molecular structure of a macromolecule and its physiological role in the organism; • knows basic techniques and research tools used in biochemistry; • reads and understands scientific literature in the field of biochemistry, which describes structures and functions of proteins, carbohydrates, lipids and nucleotides; • takes advantage of the online resources and literature to obtain information in the area biochemistry; • learns a given subject by himself; • can briefly present and discuss selected scientific topics. 	<p>Symbols for relevant directional learning outcomes:</p> <p>K1_W01, K1_W05, K1_W06 K1_W08</p> <p>K1_U03, K1_U04, K1_U11, K1_U12</p>
15.	<p>Recommended literature:</p> <ul style="list-style-type: none"> • JM. Berg, JL Tymoczko, L. Stryer: Biochemistry, Macmillan, 2019. • R.H. Garrett, C.M. Grisham: Biochemistry, Thomson 2012. 	

	<ul style="list-style-type: none"> • D L. Nelson, M. M. Cox: Lehninger Principles of Biochemistry, Macmillan, 2017. 	
16.	Methods of verification of the assumed learning outcomes: <ul style="list-style-type: none"> • written exam, • lecture quizzes, • discussions. 	
17.	Conditions and form of credit for individual components of the course: <ul style="list-style-type: none"> • obtaining a passing grade for the exam • the final assessment may also take into account the student's activity during classes (quizzes and discussions) 	
18.	Student workload expressed in teaching hours and ECTS credits	number of hours allocated for the course of a given type of classes
	classes (according to the study plan) with the instructor: <ul style="list-style-type: none"> • lecture 	45 h
	student's own work (including participation in group work) e.g.: <ul style="list-style-type: none"> • ongoing preparation for class activities (quizzes and discussions); • preparation for the final exam. 	65 h
	Total number of class hour	110 h
	Number of ECTS credits:	5 ECTS