



Subject card

Subject name and code	BIOCHEMISTRY OF CELL MACROMOLECULES, PG_00064425						
Field of study	Chemistry						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2029/2030		
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Iwona Gabriel				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=5016						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		2.0		18.0	50
Subject objectives	The main aim of the course is to familiarize students with the structure and role of components of living cells and with the functioning of the main pathways of cellular metabolism, with particular emphasis on the basics of metabolic diseases.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W02] classifies acquired information, assessing its usefulness in solving the posed problems concerning the synthesis and analysis of selected groups of compounds, determining their physical and chemical properties, making measurements and determining the parameters of chemical reactions and processes		has knowledge of the structure and role of the components of living cells, including proteins, nucleic acids, polysaccharides, and lipids.		[SW1] Assessment of factual knowledge		
	[K6_W06] identifies trends in research and scientific apparatus in the fields of science and scientific disciplines relevant to chemistry and chemical engineering		has the knowledge necessary to correctly select appropriate measurement and calculation methods for determining the basic kinetic parameters of enzymatic reactions; has knowledge of the potential applications of basic biochemical techniques and their use in diagnostics and molecular biology; is familiar with the major metabolic pathways and the biochemical basis of selected metabolic diseases.		[SW1] Assessment of factual knowledge		
	[K6_K04] is able to identify and resolve dilemmas related to the chemical engineering profession while respecting traditions and ethical principles		is aware of the risks associated with the use of biologically active compounds and resulting from this potential for disruption of metabolic pathways; understand the ethical aspects of conducting research involving human participants.		[SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	Course content – lecture 1. Biomolecules - amino acids, peptides and proteins 2. Biomolecules - sugars and polysaccharides 3. Biomolecules - lipids. Structure of biological membranes, transport 4. Enzymes - structure, mechanisms of action and activity regulation 5. Main catabolic pathways - glycolysis, Krebs cycle, respiratory chain, fatty acid oxidation 6. Examples of anabolic pathways 7. High-energy compounds 8. Integration and regulation of metabolism 9. Etiology of inborn metabolic diseases		
Prerequisites and co-requisites	Knowledge of issues in the field of general chemistry: chemical bonds; intermolecular interactions; types and mechanisms of chemical reactions; properties of water, aqueous solutions. Knowledge of issues in the field of organic and physical chemistry: organic compounds - types and reactivity; theory of catalysis, thermodynamics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test I	50.0%	50.0%
	Test II	50.0%	50.0%
Recommended reading	Basic literature	Harpers Illustrated Biochemistry , 2018, ed. VII; Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, Anthony P. Weil; Publisher: PZWL	
	Supplementary literature	Biochemistry; 2018; Berg Jeremy M. , Tymoczko John L. , Stryer Lubert , Gatto Gregory J. Publisher PWN;	
	eResources addresses		
Example issues/ example questions/ tasks being completed	not applicable		
Practical activities within the subject	Not applicable		

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