



## Subject card

Subject name and code	Biochemistry, PG_00037491						
Field of study	Biotechnology						
Date of commencement of studies	October 2021		Academic year of realisation of subject			2023/2024	
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study 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	3		Language of instruction			Polish	
Semester of study	5		ECTS credits			6.0	
Learning profile	general academic profile		Assessment form			exam	
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Iwona Gabriel				
	Teachers		dr inż. Agnieszka Potęga dr hab. inż. Iwona Gabriel				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	60.0	15.0	0.0	0.0	0.0	75
	E-learning hours included: 0.0						
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	75		10.0		65.0	150
Subject objectives	To know the background knowledge about the function of living organisms in the field of biochemical data, means in the field of chemical structures, physicochemical interactions and biological processes						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_W05		Know the background about the function of living organisms on the level of biochemical processes, taking into account the differences between eucaryotic and procaryotic cells. The student knows the main metabolic pathways and is able to assess the consequences of metabolic disorders.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		
	K6_W06		The student knows the physical and biochemical basis of biocatalysis. The student knows the basic principles of the structure of biomacromolecules.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation		

Subject contents	<p>1. Introduction</p> <p>2. Proteins, the structures and functions.</p> <p>3. DNA, RNA genetic information translation,</p> <p>4. Enzymes, the catalytic and and regulatory strategy,</p> <p>5. Carbohydrates, structures, physiological function, binding with the membrane proteins.</p> <p>6. Lipids in the function of biological membranes,</p> <p>7. Metabolic transformations in the cell, ATP in the role of the universal energy transporter,</p> <p>8. Glicolysis pathway and gluconeogenesis,</p> <p>9. Cytric acid cycle, Synthesis of acetylcoenzymeA, the stechiometry and control mechanisms,</p> <p>10. Oxidative phosphorylation. From NADH to O<sub>2</sub> in the mitochondrium,, redox potential,</p> <p>11. Photosynthesis. Chloroplasts and tylacoid membrane. NADPH and proton gradient,</p> <p>12. Lipid acids metabolism, degradation and biosynthesis. CoA activation, carnityne function. Biodegradation versus biosynthesis pathways.</p> <p>13. The metabolism of nitrogen. The level regulations of proteins and aminoacids</p> <p>14.The integration of metabolic processesin the living organism</p> <p><b>Biochemistry exercises</b> : The aim is to learn students the effective methods of biochemical process calculations. There is crucial for the preparation of the solutions with proper concentration for biochemical experimets as the rate of biochemical transformations or the molecular mechanisms of biochemical processes</p>		
Prerequisites and co-requisites	The background knowledge in the field of biology, chemistry and physics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Writting and oral exam	60.0%	80.0%
	calculation exercises	60.0%	20.0%
Recommended reading	Basic literature		<p>J.M.Berg, J.L.Tymoczko, L.Stryer, Biochemistry, English version</p> <p>J.L.Tymoczko, J.M.Berg, L.Stryer, Biochemistry, short edition, English version</p>
	Supplementary literature		M.K. Campbell, S.O.Farell, Biochemistry, 2006
	eResources addresses		Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	<p>1. Which tricarbon molecules are formed by the degradation of fructoso-1,6-bisfosforan?</p> <p>2. What reaction do aminotransferases catalyze and what is their role in amino acid catabolism?</p> <p>3. Present the role of electron transfer from the cytric acid cycle by oxidative phosphorylation to ATP synthesis</p>
Work placement	Not applicable