



Subject card

Subject name and code	Biochemistry, PG_00037494						
Field of study	Biotechnology						
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023				
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	6	ECTS credits	4.0				
Learning profile	general academic profile	Assessment form	assessment				
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Ewa Augustin					
	Teachers	dr hab. Ewa Augustin dr inż. Agnieszka Potęga dr inż. Paweł Filipkowski dr inż. Izabela Koss-Mikołajczyk Michał Kosno Aleksandra Kuplińska dr inż. Andrzej Skwarecki dr inż. Kamila Rząd					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	60.0	0.0	15.0	75
	E-learning hours included: 0.0						
	Additional information: Laboratory: Students perform biochemical experiments, which were prepared earlier by the teacher. Seminar: Students prepare individual scientific video-presentations related to the current subjects of biochemical field proposed by the teacher and developed by the student.						
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	5.0	20.0	100		
Subject objectives	1. seminarium; to extend the general biochemical knowledge considering the current intensive research in this field 2. laboratory: to extend the general biochemical knowledge and to learn the basic experimental technics together with the formulation of conclusions on the basis of experimental results.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_W05	Kept the background and the extended knowledge in the field of the physiology of the living organisms considering particularly molecular structure and pharmacological properties of biologically active compounds	
	K6_U05	Know, how to perform biochemical experiments in the field of enzymatic kinetics and of the analysis of physiologically important proteins and nucleic acids	
	K6_W06	Kept the background and the extended knowledge in the field of the physiology of the living organisms.	
Subject contents	Seminars		
	<p>1. Microorganisms; current ideas in antibacterial drug resistance. The human microbion - bacterias as our friends. New pathogens: fungi, fungal diseases for mammals.</p> <p>2. Immunological system: for protecting against immunological diseases, how to predict their progression? the role of heat shock proteins in our health.</p> <p>3. Senescence: the reason of earlier death or the defence against tumor development, the function of mTOR protein.</p> <p>4. our current tasks in therapy of HIV: vaccines, DNA therapy, genetic resistance to HIV.</p> <p>5. New attitude to antioxidants and vitamins. are there free radicals toxic? for what there are in nature? What is the unknown role of vitamin D?</p> <p>6. Our nervous system: how to keep the continuous skillness? can we improve the brain skillness with pharmaceuticals? what is the mechanism of Parkinson and Alzheimer diseases? Can we protect against or be before the serious symptoms? Is it possible to come back with merihuana as a therapeutic agent?</p> <p>Laboratory:</p> <p>Analytical methos of separation and identyfication of aminoacids. Methods of protein concentration analysis. The application of calorimetric methods in biochemistry. Physicochemical properties of proteins. SDZ PAGE separation of proteins. Kinetic parameters of enzymatic reactions. The cleaning of yeast inverase. The isolation of lipids from nutmeg. Structural analysis of glicogene. Chrophile analysis by thin layer chromatography. Determination of vitamin C in the food</p>		
Prerequisites and co-requisites	The background in cell biology and biophysics, organic chemistry, inorganic chemistry and analytical chemistry.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	the preparation to laboratory experiments.	50.0%	10.0%
	individual preparation of the presentation	60.0%	40.0%
	the participation in the laboratory and seminars,	10.0%	10.0%
	the preparation the experiment raport.	60.0%	40.0%

Recommended reading	Basic literature	Seminarium: Scientific American current editions and the proposed by teacher articles. Laboratory: Biochemistry. Laboratory exercises. Script edited by S.Milewski. and the individual instructions for the selected laboratory.
	Supplementary literature	Students collect the literature data themselves
	eResources addresses	
Example issues/ example questions/ tasks being completed	<p>Seminarium</p> <ol style="list-style-type: none"> 1.The recent discoveries related to the bacteria resistance against antibiotics. 2. The function of immunological system in warning against illness. Compare with the role chaperone proteins. 3. Senescence: the cause of the organism aging or is it the defence against cancerogenesis? The role of mTOR proteis. 4. The current knowledge in the field of anty-HIV therapy: vaccine, DNA therapy, innate immunity. 5. The new theories related to antyoxidants and vitamines. What is the role of free radical? they are really harmful? 6. The human nervous system: how to keep its good efficiency, what would be the role of therapeutics in the increasing of brain conditions? <p>Laboratory</p> <ol style="list-style-type: none"> 1. Which method would you apply for the aminoacids separation and identifyfication? 2. Give the examples of the calorimetric methods applications 3. Describe the SDS PAGE procedure for the proteins separations 4. Characterize the parameters for the description of enzymation transformations. 5. What is the procedure for the analysis of chlorophile in the for examble oak leave? 	
Work placement	Not applicable	