GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Biochemistry, PG_00054745		
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	6	ECTS credits	5.0
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. inż. Iwona Gabriel	
	Teachers	dr hab. inż. Iwona Gabriel dr inż. Andrzej Skwarecki dr inż. Agnieszka Potęga dr inż. Karolina Pełka dr inż. Paweł Szczeblewski	

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 independently perform biochemical experiments prepared by a teacher and under supervision. Seminar: Students prepare individual scientific and/or popular science presentations on current biochemistry issues in the field of material proposed by the lecturer and supplemented 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	8.0	42.0	125

Subject objectives	
	1. semiarium; 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	Student expanded the biochemical knowledge in the field of enzymology, metabolism and genetic background by preparing and giving a presentation	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
K6_U03	Student knows the basics of experimental work in biochemistry, including enzyme kinetics.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information
K6_W06	Student acquired basic and extended knowledge about the functioning of living organisms, taking into account in particular the importance of molecular structures and their properties.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
K6_U05	Student reached the the new field of knowledge about the background of physiological processes through the participation in the laboratory exercises. It is the way to expand the student competency in the field of experimental work, means technical preparation to the laboratory technics, laboratory experiments and results preparation and interpretation.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

Subject contents

Seminars

1. Microorganisms; current ideas in antibacterial drug resistance. The human microbion - bacterias as our friends. New patogens: fungi, fungal diseases for mammals.

2. Immunological system: for protecting against immunological disseases, how to predict their progression? the role of heat shock proteins in our health.

3. Senescence: the reason of earlier death or the defence against tumor development, the function of mTOR protein.

4. our current tasks in therapy of HIV: vaccines, DNA therapy, genetic resistance to HIV.

5. New attitiude to antioxidants and vitamins. are there free radicals toxic? for what there are in nature? What is the unknown role of vitamin D?

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 Alzhaimer diseases? Can we protect against or be before the serious symptoms? Is it possible to come back with merihuana as a therapeutic agent?

Laboratory:

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

Prerequisites and co-requisites

Positive grade in the exam (5th semester). 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
Laboratory classes	60.0%	50.0%
Individual preparation of the presentation	60.0%	50.0%

<table>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Seminarium: Proposed by a teacher articles.

Laboratory: Biochemistry. Laboratory exercises. Script edited by Augustin Ewa

Szczeblewski Paweł, Kwaśniewska Anna, Marycz Milena, Mazerska Zofia, Augustin Ewa, Pilch Joanna, Potęga Agnieszka, Wandas Anna, Mieszkowska Anna ISBN: 978-83-7348-879-3

and the individual instructions for the selected laboratory.</td></tr>
<tr><td>Supplementary literature</td><td>Students collect the literature data theirselves</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Seminarium

1.The recent discoveries related to the bacteria resistance against antybiotics.

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 harmfull?

6. The human nervous system: how to keep its good efficiency, what would be the role of therapeutics in the increasing of brain conditions?

Laboratory

1. Which method would you apply for the aminoacids separation and identyfication?

2. Give the examples of the calorymetric 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 examle oak leave?</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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