



## Subject card

Subject name and code	Laboratory of the Physical Chemistry, PG_00054706						
Field of study	Biotechnology						
Date of commencement of studies	October 2022	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	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Physical Chemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jarosław Wawer					
	Teachers	dr inż. Joanna Grabowska dr hab. Aneta Panuszko dr hab. inż. Jarosław Wawer					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	45.0	0.0	0.0	45
	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	45	3.0		27.0		75
Subject objectives	Students after the course should: - understand the basics of the following techniques: potentiometry, spectrophotometry, conductometry, calorimetry, the measurement of surface tension, refractive index, density, boiling point, viscosity - be able to apply this techniques in order to solve a specific problems - be able to make all necessary calculations and draw the conclusions						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U02	Student is able to predict the progress of the process and the properties of the biomolecules using the knowledge from the chemistry (including physical chemistry)			[SU2] Assessment of ability to analyse information		
	K6_U09	Student gains practical skills to use spectrophotometer and other analytical methods.			[SU4] Assessment of ability to use methods and tools		
	K6_W09	Student gains the knowledge about analytical methods (including spectroscopy) used in biotechnology.			[SW1] Assessment of factual knowledge		
	K6_U01	Student is able to recalculate the experimental data to determine the requested quantity. Student is able to analyse the data using the basic knowledge from the physics.			[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		

Subject contents	Student should pass 6 tests and perform 6 experiments:  Part 1 1. Spectrophotometry; determination of the composition of complexes 2. Molecular weight of polymers 3. The physicochemical properties of liquids 4. Potentiometry; kinetics of iodination of aniline 5. Phase diagram liquid-vapor 6. Conductometry		
Prerequisites and co-requisites	The student should be familiar with basic tools in Mathematics and Physics at the level required form second-year student of Technical University. The student should be familiar with Chemistry at the level required form second-year student of Chemical Faculty.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test	60.0%	80.0%
	Report	85.0%	20.0%
Recommended reading	Basic literature	H. Strzelecki, W. Grzybkowski "Physical Chemistry - laboratory classes" Wydawnictwo PG, Gdańsk, 2004 P. W. Atkins "Physical Chemistry" PWN, Warszawa, 2003	
	Supplementary literature	Detailed bibliography can be found in H. Strzelecki, W. Grzybkowski "Chemia fizyczna - Ćwiczenia laboratoryjne" Wydawnictwo PG, Gdańsk, 2004	
	eResources addresses	Adresy na platformie eNauczanie: Laboratorium Chemii Fizycznej (lato 2023_24, BT sem. 4) - Moodle ID: 36201 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36201">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36201</a>	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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