



Subject card

Subject name and code	Laboratory of the Physical Chemistry, PG_00054706						
Field of study	Biotechnology						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jarosław Wawer				
	Teachers		dr hab. inż. Jarosław Wawer				
Lesson types	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						
	eNauczanie source addresses: Moodle ID: 3140 Laboratorium Chemii Fizycznej (lato 2025_26, BT sem. 4) https://enauczanie.pg.edu.pl/2025/course/view.php?id=3140						
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, 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_U09	The student is able to operate a spectrophotometer and apply other analytical methods in laboratory practice.			[SU4] Assessment of ability to use methods and tools		
	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_W09	Student has 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.			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information		

Subject contents	<p>Course content – laboratory Students are required to pass six tests and complete six experiments.</p> <ol style="list-style-type: none"> 1. Spectrophotometry; determination of the composition of complexes 2. Viscometry; molecular weight of polymers 3. The physicochemical properties of liquids 4. Potentiometry; kinetics of iodination of aniline 5. Liquidvapor phase diagram in a binary system 6. Conductometry; conductometric titration 											
Prerequisites and co-requisites	<p>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.</p>											
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Report</td> <td>95.0%</td> <td>0.0%</td> </tr> <tr> <td>Test</td> <td>60.0%</td> <td>100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Report	95.0%	0.0%	Test	60.0%	100.0%
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Recommended reading	Basic literature	<p>H. Strzelecki, W. Grzybkowski "Physical Chemistry - laboratory classes" Wydawnictwo PG, Gdańsk, 2004 P. W. Atkins "Physical Chemistry" PWN, Warszawa, 2003</p>										
	Supplementary literature	<p>Detailed bibliography can be found in H. Strzelecki, W. Grzybkowski "Chemia fizyczna - Ćwiczenia laboratoryjne" Wydawnictwo PG, Gdańsk, 2004</p>										
	eResources addresses											
Example issues/ example questions/ tasks being completed	<p>Effect of a solute on the UV-VIS spectrum. Determination of liquid viscosity using an Ubbelohde viscometer. Physicochemical properties of liquids measurement methods and physical laws used for their determination. Nernst equation in potentiometric measurements, Stockholm Convention. Phase diagrams for binary systems interpretation of diagram. Conductivity, specific conductivity, molar conductivity of electrolyte solutions, and their variation with concentration.</p>											
Practical activites within the subject	<p>Not applicable</p>											

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