GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Laboratory of the Physical Chemistry, PG_00054706		
Field of study	Biotechnology		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
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. inż. Jarosław Wawer dr hab. inż. Maciej Śmiechowski dr hab. Aneta Panuszko	

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 biomolecles using the knowledge from the chemistry (including physical chemistry)	[SU2] Assessment of ability to analyse information
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
K6_W09	Student gains the knowledge about analytical methods (including spectroscopy) used in biotechnology.	[SW1] Assessment of factual knowledge
K6_U09	Student gains practical skills to use spectrophotometer and other analytical methods.	[SU4] Assessment of ability to use methods and tools

<table>
<tr><td>Subject contents</td><td>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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>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.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Test</td><td>60.0%</td><td>80.0%</td></tr><tr><td>Report</td><td>85.0%</td><td>20.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>H. Strzelecki, W. Grzybkowski "Physical Chemistry - laboratory classes" Wydawnictwo PG, Gdańsk, 2004
P. W. Atkins "Physical Chemistry" PWN, Warszawa, 2003</td></tr><tr><td>Supplementary literature</td><td>Detailed bibliography can be found in H. Strzelecki, W. Grzybkowski "Chemia fizyczna - Ćwiczenia laboratoryjne" Wydawnictwo PG, Gdańsk, 2004</td></tr><tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Laboratorium Chemii Fizycznej (lato 2024_25, BT sem. 4) - Moodle ID: 43710
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=43710</td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>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.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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