



## Subject card

Subject name and code	Laboratory Practice, PG_00053077						
Field of study	Chemistry						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department Of Inorganic Chemistry -> Faculty Of Chemistry -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Damian Rosiak				
	Teachers		dr inż. Damian Rosiak  dr inż. Joanna Grabowska  dr inż. Andrzej Okuniewski  dr inż. Monika Gensicka-Kowalewska  mgr inż. Bartosz Nowosielski  Joachim Eichenlaub  prof. dr hab. inż. Krystyna Dzierzbicka				
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		2.0		28.0	75
Subject objectives	Mastering the basic techniques used in chemical laboratories.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U03] can make detailed documentation of the results of self-conducted experiments and prepare a report describing these results		The student is able to document the results of independently conducted experiments and prepare a report on their basis.		[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K6_U09] can recognize the danger, counteract and work with chemical reagents and basic technical apparatus in accordance with the safety regulations		The student knows how to work with chemical reagents and basic technical equipment in accordance with the principles of health and safety, and can recognize and counteract the danger.		[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		

Subject contents	1. Chemical laboratory. Installations: water, gas, electricity, ventilation. Personal protection measures, Health and safety regulations and rules. First aid in accidents, hazards (work with flammable, explosive, corrosive, toxic substances, fire fighting) 2. Chemicals: types, labeling, transport, storage, neutralization. 3. Technical gases: types, transport, storage, gas cylinder service, manometers. Flammability, toxicity and explosiveness of gases. 4. Laboratory vessels: glass, quartz, porcelain. Wood, metal and plastic fittings. 5. Laboratory operations: heating, cooling, drying. Work under increased and reduced pressure Equipment: burners, furnaces, distillers, dryers, autoclaves, vacuum lines. 6. Laboratory glassware used in organic synthesis (types of vessels, their names, purpose, washing and drying glassware). 7. Laboratory kits for typical activities performed in the Organic Chemistry laboratory: 7.1 Heating with reflux condenser 7.2 Filtration under reduced pressure 7.3 Extraction 7.4 Assembling the apparatus and performing the distillation: simple, steam, fractional and vacuum distillation 7.5 Crystallization (method of implementation, solvent selection, use of activated carbon) 7.6 Cooling baths 7.7 Construction, application and operation of a rotary evaporator 8. Preparation of solutions of known concentration (composition). Laboratory glassware used for the preparation of solutions (types of pipettes, burettes, volumetric flasks). Commensurability of the pipette and volumetric flask. Scales and weighing - preparation of samples and solutions by weight. Titration. 9. Temperature measurement - types of thermometers and their purpose 10. Construction, operation and application of thermostats. Construction and operation of a contact thermometer, other regulators. 11. Basics of electrochemistry - electrolysis of solutions, potentiometric measurement.														
Prerequisites and co-requisites	Knowledge of chemistry at the high school level.														
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Tests and results in the Department of Physical Chemistry</td><td>60.0%</td><td>33.0%</td></tr><tr><td>Tests and results in the Department of Inorganic Chemistry</td><td>60.0%</td><td>34.0%</td></tr><tr><td>Tests and results in the Department of Organic Chemistry</td><td>60.0%</td><td>33.0%</td></tr></table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Tests and results in the Department of Physical Chemistry	60.0%	33.0%	Tests and results in the Department of Inorganic Chemistry	60.0%	34.0%	Tests and results in the Department of Organic Chemistry	60.0%	33.0%
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Recommended reading	<table><tr><td>Basic literature</td><td>1. N. Bellen, A. Gutorska: Poradnik laboranta chemika. WNT, Warszawa 1985. D. Witt, K. Dzierzbicka, J. Rachoń: Syntezy i transformacje związków organicznych. Wyd. PG, Gdańsk 2007.</td></tr><tr><td>Supplementary literature</td><td>1. A. I. Vogel: Preparatyka Organiczna, WNT, Warszawa 2006. 2 B. Bochwica (tłum.): Preparatyka Organiczna, PWN, Warszawa 1971.</td></tr><tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie: 2022/23 Techniki laboratoryjne, Chemia I stopień - Moodle ID: 25027 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25027">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25027</a></td></tr></table>			Basic literature	1. N. Bellen, A. Gutorska: Poradnik laboranta chemika. WNT, Warszawa 1985. D. Witt, K. Dzierzbicka, J. Rachoń: Syntezy i transformacje związków organicznych. Wyd. PG, Gdańsk 2007.	Supplementary literature	1. A. I. Vogel: Preparatyka Organiczna, WNT, Warszawa 2006. 2 B. Bochwica (tłum.): Preparatyka Organiczna, PWN, Warszawa 1971.	eResources addresses	Adresy na platformie eNauczanie: 2022/23 Techniki laboratoryjne, Chemia I stopień - Moodle ID: 25027 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25027">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25027</a>						
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Example issues/ example questions/ tasks being completed	1. What is the molar concentration of the solution resulting from dissolving 20 g of potassium sulphate K <sub>2</sub> SO <sub>4</sub> in 250 ml of water?  2. Calculate the percentage of the solution that was obtained by dissolving 10 g of sodium chloride NaCl in 40 g of water.  3. What is electrolytic dissociation?  4. What is the self-ionization process? Give an example.  5. Define the terms: atom oxidation state, oxidant, reductant, oxidation, reduction.														
Work placement	Not applicable														

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