



Subject card

Subject name and code	Laboratory Practice, PG_00053077						
Field of study	Chemistry						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2023/2024		
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						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Andrzej Okuniewski					
	Teachers	dr inż. Andrzej Okuniewski dr inż. Joanna Grabowska dr inż. Anna Kuffel dr inż. Monika Gensicka-Kowalewska dr inż. Aleksandra Ziółkowska prof. dr hab. inż. Krystyna Dzierzbicka dr inż. Anna Ordyszewska					
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_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.			[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
	[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.			[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task		

Subject contents	<p>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)</p> <p>2. Chemicals: types, labeling, transport, storage, neutralization.</p> <p>3. Technical gases: types, transport, storage, gas cylinder service, manometers. Flammability, toxicity and explosiveness of gases.</p> <p>4. Laboratory vessels: glass, quartz, porcelain. Wood, metal and plastic fittings.</p> <p>5. Laboratory operations: heating, cooling, drying. Work under increased and reduced pressure Equipment: burners, furnaces, distillers, dryers, autoclaves, vacuum lines.</p> <p>6. Laboratory glassware used in organic synthesis (types of vessels, their names, purpose, washing and drying glassware).</p> <p>7. Laboratory kits for typical activities performed in the Organic Chemistry laboratory:</p> <p>7.1 Heating with reflux condenser</p> <p>7.2 Filtration under reduced pressure</p> <p>7.3 Extraction</p> <p>7.4 Assembling the apparatus and performing the distillation: simple, steam, fractional and vacuum distillation</p> <p>7.5 Crystallization (method of implementation, solvent selection, use of activated carbon)</p> <p>7.6 Cooling baths</p> <p>7.7 Construction, application and operation of a rotary evaporator</p> <p>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.</p> <p>9. Temperature measurement - types of thermometers and their purpose</p> <p>10. Construction, operation and application of thermostats. Construction and operation of a contact thermometer, other regulators.</p> <p>11. Basics of electrochemistry - electrolysis of solutions, potentiometric measurement.</p>														
Prerequisites and co-requisites	Knowledge of chemistry at the high school level.														
Assessment methods and criteria	<table border="1" data-bbox="448 763 1489 974"> <thead> <tr> <th data-bbox="448 763 798 801">Subject passing criteria</th> <th data-bbox="802 763 1141 801">Passing threshold</th> <th data-bbox="1145 763 1489 801">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 801 798 857">Tests and results in the Department of Organic Chemistry</td> <td data-bbox="802 801 1141 857">60.0%</td> <td data-bbox="1145 801 1489 857">33.0%</td> </tr> <tr> <td data-bbox="448 857 798 913">Tests and results in the Department of Inorganic Chemistry</td> <td data-bbox="802 857 1141 913">60.0%</td> <td data-bbox="1145 857 1489 913">34.0%</td> </tr> <tr> <td data-bbox="448 913 798 974">Tests and results in the Department of Physical Chemistry</td> <td data-bbox="802 913 1141 974">60.0%</td> <td data-bbox="1145 913 1489 974">33.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Tests and results in the Department of Organic 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 Physical Chemistry	60.0%	33.0%
Subject passing criteria	Passing threshold	Percentage of the final grade													
Tests and results in the Department of Organic 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 Physical Chemistry	60.0%	33.0%													
Recommended reading	<table border="1" data-bbox="448 981 1489 1422"> <tbody> <tr> <td data-bbox="448 981 798 1265">Basic literature</td> <td colspan="2" data-bbox="802 981 1489 1265">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 data-bbox="448 1265 798 1321">Supplementary literature</td> <td colspan="2" data-bbox="802 1265 1489 1321">1. A. I. Vogel: Preparatyka Organiczna, WNT, Warszawa 2006. 2 B. Bochwica (tłum.): Preparatyka Organiczna, PWN, Warszawa 1971.</td> </tr> <tr> <td data-bbox="448 1321 798 1422">eResources addresses</td> <td colspan="2" data-bbox="802 1321 1489 1422">Adresy na platformie eNauczenie: Techniki laboratoryjne (Chemia) 2023/24 - Moodle ID: 30847 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30847</td> </tr> </tbody> </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 eNauczenie: Techniki laboratoryjne (Chemia) 2023/24 - Moodle ID: 30847 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30847				
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 eNauczenie: Techniki laboratoryjne (Chemia) 2023/24 - Moodle ID: 30847 https://enauczenie.pg.edu.pl/moodle/course/view.php?id=30847														
Example issues/ example questions/ tasks being completed	<p>1. What is the molar concentration of the solution resulting from dissolving 20 g of potassium sulphate K₂SO₄ in 250 ml of water?</p> <p>2. Calculate the percentage of the solution that was obtained by dissolving 10 g of sodium chloride NaCl in 40 g of water.</p> <p>3. What is electrolytic dissociation?</p> <p>4. What is the self-ionization process? Give an example.</p> <p>5. Define the terms: atom oxidation state, oxidant, reductant, oxidation, reduction.</p>														
Work placement	Not applicable														