



Subject card

Subject name and code	Laboratory Practice, PG_00052315						
Field of study	Chemical Technology						
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						
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_U02	The student knows how to use typical laboratory equipment and perform analyzes related to material tests.	[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 [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	K6_K03	The student knows how to work in a group and is aware of the responsibility for the effects of the work done.	[SK2] Assessment of progress of work [SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work
K6_U01	The student can get information from carefully selected sources: literature, databases and other, also in English. The student is able to integrate the obtained information, interpret it, as well as draw conclusions, formulate and justify opinions.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment	
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	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 Organic Chemistry	60.0%	33.0%
	Tests and results in the Department of Inorganic Chemistry	60.0%	34.0%
Recommended reading	Basic literature	1. N. Bellen, A. Gutorska: Poradnik laboranta chemika. WNT, Warszawa 19852. 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:
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 K_2SO_4 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	

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