GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Laboratory Practice, PG_00060835		
Field of study	Chemical Technology		
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	2.0
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 hab. inż. Łukasz Ponikiewski prof. dr hab. inż. Krystyna Dzierzbicka dr inż. Aleksandra Ziółkowska	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30	3.0	17.0	50

Subject objectives	Mastering the basic techniques used in chemical laboratories.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U02] is able to operate typical laboratory apparatus and conduct analyses related to materials testing	The student is capable of operating typical laboratory equipment and performing routine laboratory tasks, such as chemical synthesis and analysis, as well as physicochemical 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] is aware of the responsibility for his/her own work and is ready to follow the rules of teamwork and take responsibility for the tasks performed jointly	The student is capable of working in a group and organizing tasks, learns to follow safety procedures in the chemical laboratory, and demonstrates awareness of responsibility for the work performed.	[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 [SK2] Assessment of progress of work [SK1] Assessment of group work skills

Subject contents	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). Chemicals: types, labeling, transport, storage, neutralization. Technical gases: types, transport, storage, gas cylinder service, manometers. Flammability, toxicity and explosiveness of gases. Laboratory vessels: glass, quartz, porcelain. Wood, metal and plastic fittings. Laboratory operations: heating, cooling, drying. Work under increased and reduced pressure Equipment: burners, furnaces, distillers, dryers, autoclaves, vacuum lines. Laboratory glassware used in organic synthesis (types of vessels, their names, purpose, washing and drying glassware). Laboratory kits for typical activities performed in the Organic Chemistry laboratory: • Heating with reflux condenser • Filtration under reduced pressure • Extraction • Assembling the apparatus and performing the distillation: simple, steam, fractional and vacuum distillation • Crystallization (method of implementation, solvent selection, use of activated carbon) • Cooling baths • Construction, application and operation of a rotary evaporator 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. Temperature measurement - types of thermometers and their purpose. Construction, operation and application of thermostats. Construction and operation of a contact thermometer, other regulators. Basics of electrochemistry - electrolysis of solutions, potentiometric measurement.
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 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	Basic literature	A. Okuniewski, A. Mietlarek-Kropidłowska: Techniki laboratoryjne. Materiał obowiązujący na zajęciach realizowanych w Katedrze Chemii Nieorganicznej, Gdańsk 2022. 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	A. I. Vogel: Preparatyka Organiczna, WNT, Warszawa 2006. B. Bochwica (tłum.): Preparatyka Organiczna, PWN, Warszawa 1971.
	eResources addresses	Adresy na platformie eNauczanie: Techniki laboratoryjne (Technologia Chemiczna) 2023/24 - Moodle ID: 30853 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30853
Example issues/ example questions/ tasks being completed	What is the molar concentration of the solution formed by dissolving 20 g of potassium sulfate (K_2SO_4) in 250 ml of water? Calculate the percentage concentration of the solution obtained by dissolving 10 g of sodium chloride (NaCl) in 40 g of water. What is electrolytic dissociation? What is the process of autodissociation. Provide an example. Define the terms: oxidation state of an atom, oxidizing agent, reducing agent, oxidation, reduction. Provide an example of a redox process that has industrial applications.	
Work placement	Not applicable	

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