GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Laboratory Practice, PG_00053077		
Field of study	Chemistry		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2021/2022
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 Karolina Delińska dr inż. Andrzej Okuniewski prof. dr hab. inż. Krystyna Dzierzbicka dr inż. Daria Kowalkowska-Zedler Joachim Eichenlaub	

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

Adresy na platformie eNauczanie:
Techniki laboratoryjne, Chemia I stopień (2021/2022) - Moodle ID: 17348
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17348

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	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	

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	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	Techniki laboratoryjne, Chemia I stopień (2021/2022) - Moodle ID: 17348 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17348
Example issues/ example questions/ tasks being completed	1. What is the molar concentration of the solution resulting from dissolving 20 g of potassium sulphate K2SO4 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	