University of Gdańsk

Subject card

Subject name and code	B.Sc. laboratory class, PG_00103577						
Field of study	Environmental Protection						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	undergraduate studies		Subject group	Obligatory subject group in the field of study Optional subject group			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	Polish			
Semester of study	6		ECTS credits	5.0			
Learning profile	academic		Assessment form				
Conducting unit	Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Joanna Makowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	60.0	0.0	0.0	60
	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	60		10.0	55.0	125	
Subject objectives	Aims of education To gain competences of correct performing of research in the field of selected specialization and / or topic of the diploma Acquainting with the basic aspects of the construction and operating principle of the used research equipment To gain knowledge in the field of the basic computational methods in the field of selected specialization and / or topic of the diploma Acquiring the ability of critical interpretation of the obtained results. Developing the skills of correct preparation of the diploma project.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OŚL3_U03] Independently plans and develops her/his own lifelong learning.	- Student develops the ability to think critically and assess the quality of information regarding the context of research and evaluation of results. - by reading scientific texts, Student learns to analyze and synthesize information, extract key concepts and understand complex chemical issues - Student can define a clear goal or task that he or she wants to achieve. - Student understands the need to independently search for information in the scientific literature; can formulate appropriate questions	[SU5] implementation of a problem task
	[OŚL3_K02] Works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it.	- the student knows how to work individually with initiative, i.e. can act independently, take initiative and solve problems without excessive supervision. This is an important skill in many professional fields. - the student knows how to work effectively in a team, i.e. acquires the ability to listen, communicate, resolve conflicts and perform various roles in a group. Effective collaboration contributes to the achievement of team goals	[SK5] implementation of a problem task
	[OŚL3_W10] Describes the principles of environmental protection based on basic legal regulations and instruments of applying law in environmental protection and from the point of view of economy and management of environmental resources; enumerates general aspects of the economic activity of entities.	- the student knows the principle of comprehensive environmental protection, which includes activities that minimize the emission of pollutants and guarantee reasonable management of natural resources. - the student knows the principle of prevention and precaution, i.e. encourages taking preventive and precautionary measures to avoid negative impact on the natural environment -- student is aware of the legal regulations that impose on business entities the obligation to cover the costs of repairing the damage they cause to the natural environment.	[SW3] text preparation/written work
	[OŚL3_U07] Uses basic laboratory techniques, conducts field research and performs qualitative and quantitative analyses and draws conclusions on this basis for practical purposes.	- the student knows how to use basic laboratory techniques, i.e. knows how to use laboratory tools, instruments and procedures to conduct experiments, tests and research. - the student knows how to work away from a studio or office or library or laboratory, i.e. collect samples, observe the natural environment and document the results. - the student is able to perform qualitative and quantitative analyses, i.e. assessing the quality of samples or data (e.g. chemical composition, water quality) and calculating quantities (e.g. concentration of substances). -the student, after conducting research and analysis, has the ability to draw conclusions and suggest practical actions or applications based on the collected data	[SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work

Course outcome	Subject outcome	Method of verification
[OŚL3_W04] explains the meaning and indispensability of empirical data in the description and interpretation of natural phenomena and processes (occurring in the environment).	Student: knows the basic relationships between various disciplines of natural and exact sciences, to describe the basic natural phenomena and processes, uses knowledge in the field of mathematics, physics, chemistry and biology understands the importance of experimental research in the description and interpretation of natural phenomena and processes knows the course of natural processes occurring in nature as well as phenomena and processes caused by anthropopressure knows the basic relationships between the content of specific pollutants and the state of the environment (including human health), describes the occurrence of adverse phenomena on a local, regional and global scale understands the basic mechanisms of economic and consumption pressure on the environment; characterizes the possibilities of limiting it lists and describes the basic techniques and research tools in environmental protection knows the basic methods, techniques and tools for rational management of natural resources lists and describes the basic principles of safety, ergonomics and hygiene at work lists and describes the basic legal regulations and instruments of law application in environmental protection	[SW4] test/exam - oral or written [SW3] text preparation/written work

Course outcome	Subject outcome	Method of verification
[OŚL3_K03] Independently sets or implements a set action plan specifying priorities for its implementation; critically assesses its progress.	Student: identifies the level of their knowledge and skills and understands the need for further education appreciates the importance of acquired knowledge and skills for achieving sustainable development in all its aspects correctly identifies and resolves dilemmas related to the practice of the profession shows creativity in independent action, is able to work in a team, fulfilling various roles in it takes actions taking into account the priorities to achieve the intended goals demonstrates responsibility for the safety of own and other people's work and the workplace, adheres to the rules of conduct in emergencies is versed in the general principles of creating and functioning of forms of individual entrepreneurship in the field of broadly understood environmental protection	[SK2] presentation/project/paper/ report
[OŚL3_U11] Uses statistical methods as well as algorithms and IT techniques, including application software packages to describe environmental experiments and analysis of typical data in socio-economic activities based on science and natural sciences.	Student: is able to plan and carry out simple measurement and analytical procedures in the field of the selected specialty and/or subject of the diploma project can use the computer as an auxiliary tool to search for information, communicate, analyze data, prepare reports or present results takes care to use only those research methods and tools that allow rational use, shaping and reproduction of natural resources is able to conduct a discussion on environmental protection using the correct terminology in the field of environmental protection and the nomenclature of individual disciplines related to it uses basic mathematical and statistical methods and IT techniques to describe phenomena and analyze data draws conclusions on the basis of collected experimental and literature data; combines natural and exact content with legal, sociological and economic issues knows how to prepare a documented study of environmental protection problems in Polish attempts to solve some problems related to the quality of the environment and human life as well as sustainable development, can present them in the form of a documented study	[SU6] demonstration of practical skills

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<tr><td></td><td colspan="2"><table>
<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td>[OŚL3_U02] Plans, selects appropriate research and measuring equipment and devices, performs physicochemical measurements and experiments; analyses the results and draws conclusions based on them.</td><td>- student is able to plan the purpose of the study, the selection of appropriate measurement methods and tools.
- student knows how to choose the right equipment and devices to conduct the experiment (taking measurements related to the physical and chemical properties of the samples).
- student knows how to conduct the experiment as planned and analyze the results: process the measurement data and write conclusions based on them.</td><td>[SU5] implementation of a problem task</td></tr>
</table></td></tr>
<tr><td>Subject contents</td><td colspan="2">The program contents are varied and adapted to the scope of the chosen specialization and/ or and / or topic of the diploma</td></tr>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">Prerequisites

Knowledge of basic issues in the field of chemistry and / or related scientific fields</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Preparation and presentation of several multimedia presentations related to the research topic</td><td>100.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>Basic literature</td><td>Bibliography of literature

A. Literature required to pass the course :
A.1. Literature used during classes:

Books and scientific articles are related to the selected speciality mode and / or to the topic of diploma project

A.2. Literature for individual studies:
Books and scientific articles are related to the selected speciality mode and / or to the topic of diploma project</td></tr>
<tr><td></td><td>Supplementary literature</td><td>B. Extracurricular readings

Books and scientific articles are related to the selected speciality mode and / or to the topic of diploma project</td></tr>
<tr><td></td><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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