GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00059471		
Field of study	Biotechnology		
Date of commencement of studies	February 2022	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Chemistry, Technology and Biochemistry of Food -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Barbara Kusznierewicz	
	Teachers		

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	0.0	0.0	45

Subject objectives

The aim of the course is to provide knowledge on modern instrumental methods used in food analysis. Acquiring by the student the ability to operate the apparatus and devices used in the analysis and evaluation of the quality of raw materials and food products. Developing the ability to properly calculate and interpret the results of chemical analyzes.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_W06	The student knows the basics of chromatography, MS spectroscopy and UV-VIS, understands the principles of operation of measuring equipment and is able to adjust the method to the given problem	[SW1] Assessment of factual knowledge
K7_U09	The student is able to correctly perform the experiment and conduct a critical analysis of the obtained results. Student knows and applies methods of statistical analysis of results.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
K7_U11	The student selects the appropriate techniques for the determination of selected food ingredients. Analyzes the obtained results and assesses the quality of the tested material in the context of its nutritional value and biological activity.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
K7_K04	The student is able to independently solve problems, formulate questions to solve a problem or task.	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Basic concepts used in instrumental analysis. Advantages and disadvantages of instrumental methods. Stages of the analytical process, sampling and preparation of samples, standard preparation, selection of the analytical method. Fundamentals of chromatographic methods with an emphasis on liquid chromatography. Learning how to use systems and software controlling high performance liquid chromatographs (HPLC, UPLC) and instruments for high performance thin layer chromatography (HPTLC). The operation of UV / Vis detectors, light scattering, fluorometric and high-resolution mass spectrometer. Fundamentals of processing of metabolomic data.

Prerequisites and co-requisites

<table>
<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>Analyzes of selected food samples and preparation of a report</td><td>60.0%</td><td>100.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Szczepaniak Walenty (2012). Metody instrumentalne w analizie chemicznej. Wyd. PWN Warszawa.
2. Witkiewicz Zygfryd, Wardencki Waldemar, Malinowska Irena (2019) Chromatografia cieczowa, Teoria i praktyka. PWN</td></tr>
<tr><td>Supplementary literature</td><td>1. Lundanes Elsa, Reubsaet Léon, Greibrokk Tyge (2013) Chromatography: Basic Principles, Sample Preparations and Related Methods, John Wiley & Sons.
2. Fanali Salvatore, Haddad Paul R., Poole Colin F., Schoenmakers Peter, Lloyd David (2013) Liquid Chromatography Fundamentals and Instrumentation, Elsevier</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">The methods of quantitative analysis in liquid chromatography.The methods of qualitative analysis in liquid chromatography.Difference between HPLC and UPLC and TLC and HPTLC.Interpretation of the HR-MS and MS/MS spectra.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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