GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Forensic Chemistry in Ensuring Food Quality, PG_00069249						
Field of study	Biotechnology						
Date of commencement of studies	February 2025		Academic year of realisation of subject	2025/2026			
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 Biotechnology of Food -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Agnieszka Bartoszek-Pączkowska				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	0.0	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		5.0	25.0	75	
Subject objectives	The purpose of the course is to familiarise students with the topic of ensuring the food quality, including health quality, and food adulteration. The methods applied in the food quality control embrace different analytical and bioanalytical techniques which serve the purpose of detection of undesirable substances or those not declared by the producers other contaminants in food products. The biological tests are employed to detect the remains of foreign organisms or substances posing health risk. in the era of global trade, the meaning of this knowledge increases to protect consumers. The course is addressed to students of specialisations: BT, Ch, TCh.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K01] understands the need to constantly update knowledge based on the state of the art in accordance with the latest scientific literature, improve professional skills and the importance of teamwork	Student understands the significance of proper food quality for consumers' wellbeing.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
[K7_U08] prepares documentation of experiments and technological processes using professional terminology in biotechnology and related fields	Student can prepare the report based on assessment of food contamination or adulteration along with reference to legislation.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task
[K7_U02] uses research methods used in biotechnology and related fields	Student can apply experimental methods used in forensic chemistry for food quality assessment.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K7_W04] selects methods of data analysis, including bioinformatics, statistical and molecular modeling, useful for solving technological and scientific problems in biotechnology and related fields	Student is capable of choosing the adequate methods of detection of contamination or adulteration of foodstuffs according to specificity of a particular food component.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[K7_W01] defines the phenomena, processes and laws of living nature applied to the production of useful goods and the carrying out of services	Student knows theoretical foundations of methods employed in food quality assessment.	[SW1] Assessment of factual knowledge

Subject contents

Topics realized during lectures

Lectures will constitute a series of presentations dedicated to particular threats to quality and food adulteration along with reference to legal requirements. Each lecture will begin with presentation of examples of one type of registered anomaly detected in food products in recent years. Then, the sources of such substances will be discussed and health risk and/or economical risk that a given anomaly poses to consumer as well as methods of detection and assessment of such risks. The discussed groups of substances or other factors which are often behind food contamination and are legally monitored embrace: all types of pesticides, heavy metals and other toxic metals in food and potable water, microplastic and other mechanical contaminants, carcinogens and endocrine disruptors, air pollutants such as PMC entering food chain, nitrogen compounds and other inducers of food intolerance, food packaging as a source of contaminants. Some lectures will present known purposeful acts of food producers, which may mislead consumers, in particular those associated with food adulteration or not scientifically based health claims, e.g. in the case of food supplements.

Topics realized during laboratories:

The proposed laboratories will be elaborated by teachers specialising in the analysis of different food components (analytical methods, e.g. chromatographic) or biological tests used for the assessment of health safety of food (Ames test, comet assay, etc.)

Prerequisites and co-requisites

Accomplished courses in organic and analytical chemistry as well as biochemistry.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratories	60.0%	30.0%
Lectures	50.0%	70.0%

Recommended reading

Basic literature	Bezpieczeństwo i jakość żywności, Stanisław Kowalczyk, PWN and portal gov.pl dedicated to food safety.
Supplementary literature	Textbooks and internet pages dedicated to the topic of food safety and quality.
eResources addresses	

Example issues/ example questions/ tasks being completed

What does it mean food adulteration?

List the most frequent food contaminats.

What substances appearing in food may pose health risk to consumers?

Work placement

Not applicable

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