GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Functional Properties of Food Ingredients, PG_00058619		
Field of study	Biotechnology		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research 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	4.0
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. Hanna Staroszczyk	
	Teachers	dr hab. inż. Hanna Staroszczyk dr inż. Szymon Mania dr inż. Agata Sommer	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	45.0	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	8.0	32.0	100

Subject objectives	To familiarize students with the knowledge of the impact of the interaction of major components on the properties and quality of foods and the role of these components in human nutrition, as well as of contamination and food safety.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K02] is aware of the limitations and the necessity of continuous development of knowledge and technology; understands the need for education and constant training	Student is able to justify the importance of the development of science and technology for the development of food economy.	[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work
[K7_U05] is able to apply instrumental methods of quantitative and qualitative analysis and studies on activity of biomolecules, select and apply diagnostic and analytical methods in the field of his/her specialty with particular emphasis on genetic, molecular and microbiological diagnostics and diagnostics based on antigen-antibody reaction	Student isolates and identifies the basic food ingredients from raw materials of plant and animal origin.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K7_W02] has advanced knowledge of structure and activity of enzymes and biologically active compounds also in pharmacological context, knows basic instrumental methods of qualitative and quantitative analysis and activity studies of biomolecules	The student knows about the influence of enzymes present in food raw materials on the properties and quality of the resulting products. He is able to determine them.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[K7_W07] knows issues related to plant and animal raw materials, their quality, impact on human health, processing technology and chemical and biological hazards resulting from process treatment and storage	The student knows about the impact of nutrient interactions on the properties and quality of food products, as well as their effects on food safety.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents

Lecture. Physical, biochemical and chemical interactions of proteins, polysaccharides, lipids and metal ions in terms of storage and processing of food and their effects on the properties and quality of the products. The role of nutrients in human nutrition. Contamination and food safety.

Laboratory. Caramelization of saccharides. Comparison of the lactose content in dairy products. The properties of gluten. Fractionation of muscle proteins. Proteolytic activity of muscle proteins. Functional properties of proteins. The influence of different technological factors on the ability of gelation of gelatine. Interaction of proteins and polysaccharides in aqueous solutions. Colorants. Study of the kinetics of the oxidation of fats. Analysis of compounds forming in fats during high temperature processing. Qualitative composition of phospholipids present in plant and animal products. Comparison of the composition of the fatty acids present in plant and animal phospholipids.

Prerequisites and co-requisites

Knowledge of organic chemistry, general knowledge of the composition and chemical and functional properties of food components.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
laboratory tests	60.0%	50.0%
midterm colloquium	60.0%	50.0%

Recommended reading

Basic literature

- Red. Sikorski Z.E., Staroszczyk H. Chemia zwynosci. Tom 1. Głowne składniki zywnosci; Tom 2. Bilogiczne własciwosci składnikow zywnosci. PWN. Warszawa 2017.
- Red. Gawecki J. Zywienie człowieka. Podstawy nauki o zywieniu. PWN. Warszawa 2012.

	Supplementary literature	Supplementary literature • Eds. Witczak A., Sikorski Z.E. Toxins and other harmful compounds in food. CRC Press. Boca Raton. London. New York. 2017. • Eds. Sikorski Z.E. Chemical and functional properties of food components. CRC Press. Boca Raton FL 2002. • Eds. Damodoran S., Parkin K.L. Fennema's Food Chemistry. CRC Press. Boca Raton. London. New York 2017.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	• Methods for assessing the quality and safety of health food. • Chemical, physical and nutritional properties of lactose. • Class karmeli and their application. • The effect of hydration on its gelling properties gelatine way.	
Work placement	Not applicable	