



## Subject card

Subject name and code	FUNCTIONAL PROPERTIES OF FOOD INGREDIENTS, PG_00065645						
Field of study	Biotechnology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Optional subject group Specialty 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	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 -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Hanna Staroszczyk				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	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		10.0		30.0	85
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_W02] explains the structure and function of biomolecules and the methods and instruments for determining their quantity and activity		The student knows about the effect of enzymes present in food raw materials on the properties and quality of the resulting products. He is able to determine them.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K7_K02] is aware of the potential risks and opportunities associated with the development of science and technology for the natural environment and society		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] proposes solutions to technological and scientific problems in biotechnology and related fields using experimental methods and bioinformatics, statistics and specialized databases		Student isolates and identifies the basic food ingredients from raw materials of plant and animal origin.		[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		
	[K7_U04] predicts the interaction of biomolecules and biologically active compounds on living organisms and the course of processes involving them based on knowledge in biology, biotechnology and related fields and computer methods of data analysis, modeling and simulation		The student is able to determine the impact of biomolecules and biologically active compounds on the human body and knows the course of processes involving them based on knowledge of biology, biotechnology and related fields.		[SU2] Assessment of ability to analyse information		

Subject contents	<p>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.</p> <p>Laboratory. Caramelization of saccharides. Comparison of the lactose content in dairy products. 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.</p>		
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
	Midterm colloquium	60.0%	50.0%
	Laboratory tests	60.0%	50.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"><li>Red. Sikorski Z.E., Staroszczyk H. Chemia zwynosci. Tom 1. Główne składniki żywności; Tom 2. Biologiczne właściwości składników żywności. PWN. Warszawa 2017.</li><li>Red. Gawewski J. Żywnienie człowieka. Podstawy nauki o żywieniu. PWN. Warszawa 2012.</li></ul>	
	Supplementary literature	<ul style="list-style-type: none"><li>Eds. Witczak A., Sikorski Z.E. Toxins and other harmful compounds in food. CRC Press. Boca Raton. London. New York. 2017.</li><li>Eds. Sikorski Z.E. Chemical and functional properties of food components. CRC Press. Boca Raton FL 2002.</li><li>Eds. Damodoran S., Parkin K.L. Fennema's Food Chemistry. CRC Press. Boca Raton. London. New York 2017.</li></ul>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"><li>Methods for assessing the quality and safety of health food.</li><li>Chemical, physical and nutritional properties of lactose.</li><li>Class karmeli and their application.</li><li>The effect of hydration on its gelling properties gelatine way.</li></ul>		
Work placement	Not applicable		

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