



Subject card

Subject name and code	Food Technology Processes, PG_00054755						
Field of study	Biotechnology						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2026/2027		
Education level	first-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	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Chemistry Technology and Biotechnology of Food -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Robert Tylingo					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
	Additional information: The laboratory education program offers participants the opportunity to participate in these classes both on a stationary basis and through cooperation with industrial partners - food producers. By combining stationary classes with internships with industrial partners, students gain a wide range of knowledge and skills in the field of food technology processes. They can participate in research projects, test innovative solutions and understand the practical challenges faced by the food industry. Off-site activities include, among others: bakery industry, production and processing of frozen products, production of sugar and meat analogues.						
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	9.0	56.0	125		
Subject objectives	A student must be familiar with programme and technological process of food processing, and what changes occur in the manufacturing process of food ingredients, and functional properties of processed food.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_K05	Is able to identify potential negative and positive effects of biotechnological applications in food production, evaluate them and propose solutions to minimize negative impact on the environment. The student demonstrates the ability to plan and implement activities in accordance with the principles of sustainable development and social responsibility, which also includes compliance with regulations related to food safety and consumer protection	[SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness
	K6_U10	The student is able to design biotechnological processes and food products that are effective, economical and meet specific goals. He can design processes in a way that allows for the production of desired products, such as enzymes, proteins, drugs, or food products, in a controlled and efficient manner.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
	K6_W08	The student has knowledge of key applications of biotechnology in food production, such as genetic modification of plants, production of functional food or food production technologies on an industrial scale. They can also be aware of current trends and innovations in these fields	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
Subject contents	<p>Course content – lecture</p> <p>The scope of food technology, characteristics, composition, nutritional value and functional quality of food grains, oil seeds, potato, sugar beet, milk, fish, eggs, meat and other food sources. Quality and nutritional value of food products. Classification and purpose of application of food additives. General flow sheet of food processing. Pretreatment of raw food materials. Technological principles in food industry. Methods of washing and disinfection in food industry, used washing aids. The most important methods of food preservation. Unit operations and unit processes in food technology. Mechanical operations during isolation of potato starch and oil from oil seeds. Unit operations of brewing, winemaking, and meat and fish processing. Applications of heating, cooking, blanching, baking, roasting, frying, sterilization and pasteurization. Thermal operations in sugar, bakery, sausages and canned food industry. Separation of suspended matter, suspended solids and pulps. Suitability of different methods of separation in corn milling, starch separation, oil seeds processing, brewing and winemaking. Application of diffusion, emulsification, crystallization, coagulation, gelation and membrane separation in food processing. Pressing and extraction of rapeseed oil. Main methods of refining and modification of lipids. Chemical transformation of food materials: hydrolysis, neutralization and hydrogenation of lipids. Applications of chemical and enzymatic operations for production of starch syrups, protein hydrolysates and inverted sugar. Application of milk and alcoholic fermentations for production of different food products. Production of protein preparations from by-products of food industry and biomass of microorganisms.</p>		
Prerequisites and co-requisites	Basic knowledge in area of chemical technology, biotechnology and enzymology.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory classes: report, periodic practical and oral examinations.	60.0%	35.0%
	Exam	60.0%	65.0%
Recommended reading	Basic literature	<p>Pijanowski E., Dłużewski M., Dłużewska A., Jarczyk A.: Ogólna Technologia Żywności. WNT, Warszawa, 2000.</p> <p>Lewicki P.P (red.): Inżynieria Procesowa i Aparatura Przemysłu Spożywczego. WNT, Warszawa, 1999.</p> <p>Praca zbiorowa pod redakcją J. Synowieckiego, Wybrane zagadnienia z technologii fermentacyjnych przemysłu spożywczego. Wyd. PG, Gdańsk, 2007.</p> <p>Kłyszczko Stefanowicz L.: Ćwiczenia z Biochemii. PWN, Warszawa, 1999.</p> <p>Szlegel H.G.: Mikrobiologia Ogólna. PWN, Warszawa, 1996.</p>	
	Supplementary literature	<p>Sikorski Z.E. (red. naukowy): Chemia Żywności. WNT, Warszawa, 2002.</p> <p>Recent Research Developments in Food Biotechnology. Enzymes as Additives or Processing Aids. Porta R., Di Piero P., Marinello L., (red.). Research Signpost, 2008.</p> <p>Enzymatyczna Modyfikacja Składników Żywności. Kołakowski E., Bednarski W., Bielecki S., (red.), WAR, Szczecin, 2005.</p>	
	eResources addresses		

Example issues/ example questions/ tasks being completed	Fermentation technology. Technology of Cheesemaking Beer production methods. Milk processing. The sugar production process.
Practical activities within the subject	Not applicable

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