

## SDAŃSK UNIVERSITY 的 OF TECHNOLOGY

## Subject card

Subject name and code	Desing of Manufacturing Processes, PG_00058228									
Field of study	Biotechnology									
Date of commencement of studies	October 2022		Academic year of realisation of subject			2022/2023				
Education level	second-cycle studies		Subject group			Obligatory subject group 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			2.0				
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. Robert Tylingo								
	Teachers		dr hab. inż. Robert Tylingo							
			dr inż. Szymon Mania							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM		
of instruction	Number of study hours	0.0	0.0	0.0	30.0		0.0	30		
	E-learning hours included: 0.0									
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM		
	Number of study hours	30				15.0 50		50		
Subject objectives	The aim of the course is to familiarize the student with the methods of teamwork and the preparation of technical documentation of an industrial installation, taking into account industry issues, and to acquire the ability to design technological processes related to the selected diploma course, including technological projects in the food, pharmaceutical and molecular biotechnology industries.									
Learning outcomes	Course outcome		Subject outcome			Method of verification				
	[K7_U10] is able to use knowledge about possibilities, aims and limitations of biotechnology to develop, design and obtain products and biotechnological processes in the area of his/her specialization		Technology, Biotechnology and Food Analysis - food processing and HACCP system. Drug Biotechnology - pharmaceutical industry and GMP systems Molecular biotechnology - technologies for the use of genetically modified organisms and standards related legal.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject				
	[K7_W10] has knowledge in the field of bioprocess technology and engineering and knowledge in the field of engineering design of technical objects and processes including engineering graphics with the use of computer-aided design and databases		He can use the knowledge of the properties of biomolecules and the course of bioprocesses in the design of biotechnological processes.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects				
	[K7_W08] has a profound knowledge of methods of obtaining biotechnological products, possibilities and limitations related to the design of biotechnological processes, understands the specificity of the biotechnological industry, both in terms of organization, management and economic analysis		Can critically evaluate the available technical and biotechnological solutions in industry, adapt to the project economically advantageous solutions from the point of view of the resources necessary for its implementation.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects				

Subject contents	I - Project management, Critical path for the implementation of project tasks, Work schedule (Gantt chart)Reporting on the implementation of individual project tasks.II - Technological projectShort descriptionJustification of the choice of the technological methodDescription of the technological method and alternative solutionsSchematic diagram of the processMass balance (Sankey chart)Optional energy and heat balanceCharacteristics of raw materials, semi-finished products, products and auxiliary materials.Selection of apparatus, variants of apparatus depending on technological solutions and production volume.Technological schemeEquipment work schedule (Gantt chart)The critical path of the technological process						
Prerequisites and co-requisites	Has sufficient knowledge in inorganic, organic, analytical and physical chemistry to understand technological processesHas knowledge of the basic techniques and research tools used in biotechnology and selected methods of related fields and scientific disciplines; knows the development of biotechnology methods; understands the basic techniques used in the isolation, selection, synthesis, modification and analysis of organisms, tissues, cells and moleculesKnows the principles of operation of basic measurement and process equipment used in chemistry and biotechnologyCan use the scientific language typical for biotechnology						
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	Project	60.0%	100.0%				
Recommended reading	Basic literature	<ul> <li>Anderson N.G. Practical Process Research and Development.</li> <li>Academic Press, San Diego, California, USA, 2000</li> <li>Pikoń J. Podstawy Konstrukcji Aparatury Chemicznej. Cz. 1, Tworzywa Konstrukcyjne. PWN, Warszawa, 1979</li> <li>Synoradzki. L., Wisialski. J. Podstawy. projektowania. procesów technologicznych. Od laboratorium do instalacji przemysłowej. Oficyna wydawnicza Politechniki Warszawskiej. 2019</li> <li>GMP, HACCP, ISO 22000 system requirements.</li> <li>Synoradzki. L., Wisialski. J. Podstawy. projektowania. procesów</li> </ul>					
	eResources addresses						
Example issues/	Support for Auto CAD software in the implementation of technological diagrams of the designed process						
example questions/ tasks being completed							
Work placement	Not applicable						