

Subject card

Subject name and code	Biotechnological processes in the chemical industry, PG_00080742						
Field of study	Chemical Business						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2027/2028		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study 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	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Bionanotechnology -> Department of Molecular Biotechnology -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Joanna Jeżewska-Frąckowiak				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	45.0	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		1.0		4.0	50
Subject objectives	Familiarization with the issues of classical and molecular biotechnological processes in the chemical industry and application prospects molecular biotechnology methods.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BCHINŻ_W05] Describes the life cycle of devices, facilities and technical systems as well as modern environment-friendly technical solutions.	The student knows the strategy for isolating and purifying a biotechnological product.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[BCHINŻ_W07] Describes the construction and operating principles of basic scientific, technological and control-measuring apparatus.	The student knows the basic equipment and apparatus in the biotechnology laboratory.	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report
	[BCHINŻ_K03] Independently sets or implements a set action plan specifying priorities for its implementation; critically assesses its progress.	The student plans and performs assigned tasks independently and in a group laboratory, manages time and available infrastructure.	[SK2] presentation/project/paper/report [SK6] demonstration of practical skills [SK8] observation of student's independent or team work
	[BCHINŻ_U03] Plans, selects the appropriate research and measuring equipment and performs simple chemical experiments; analyses the results and draws conclusions based on them.	Conducts experiments planned in the lab program, documents and develops the results.	[SU2] presentation/project/paper/report [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
	[BCHINŻ_U06] Proposes and makes simple devices, operations or unit processes related to the implementation of the technological process used in the chemical industry, taking into account material and energy balances.	Obtains biotechnological products using classical and molecular techniques, then characterizes them and/or prepares a balance sheet.	[SU2] presentation/project/paper/report [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
	[BCHINŻ_K02] Works individually demonstrating initiative and independence in actions, and effectively cooperates in a team, performing various roles in it.	Creates student teams in which they complete assigned tasks on time and correctly.	[SK2] presentation/project/paper/report [SK6] demonstration of practical skills [SK8] observation of student's independent or team work
	[BCHINŻ_K04] Demonstrates responsibility for the safety of her/his own and others' work.	Working in a student team, the student plans an experiment in a biotechnology laboratory, applies GLP and Health and Safety principles.	[SK6] demonstration of practical skills [SK8] observation of student's independent or team work
Subject contents	Preparation of microbiological media. Obtaining bacterial biomass of <i>Escherichia coli</i> cells. Obtaining bacterial proteins from <i>Escherichia coli</i> cells. Biotechnological production of rennet cheese. Field laboratory - sewage treatment plant, sludge processing, biogas production.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	report	30.0%	12.0%
	test	51.0%	80.0%
	multimedia presentation	50.0%	8.0%
Recommended reading	Basic literature	Klimiuk E., Łebkowska M.: Biotechnologia w ochronie środowiska, PWN, 2005 Glick, B.R., Pasternak, J.J., Patten, C.L.: Molecular biotechnology: Principles and applications of recombinant DNA. ASM PRESS, 2009 Libudzisz Z., Kowal K., Żakowska Z.: Mikrobiologia techniczna, tom 2, PWN 2008 Olańczuk-Neyman K.: Laboratorium z biologii środowiska, Wyd. PG, 1998	
	Supplementary literature	websites indicated by the teacher	
	eResources addresses		
Example issues/ example questions/ tasks being completed	single choice test and open/problem questions		
Work placement	Not applicable		

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