

Subject card

Subject name and code	Microorganisms in biotechnology, PG_00132874						
Field of study	Spanish and Portuguese Studies						
Date of commencement of studies	October 2024		Academic year of realisation of subject				
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish polish		
Semester of study	5		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		dr Joanna Jeżewska-Frąckowiak				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	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	30		0.0		20.0	50
Subject objectives	Familiarizing students with the issues mentioned in the lecture program content						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
			1. The student lists and characterizes groups of microorganisms used in biotechnology. 2. The student describes preparations obtained through biotechnological methods, explains how they are produced, and gives examples of their applications. 3. The student explains biotechnological processes using microorganisms. The student correctly presents the subject matter of lecture content, using appropriately chosen sources. The student recognizes the important role and wide range of issues related to the use of microorganisms in modern biotechnology. Understands the need for ongoing curiosity and further learning in this area.		[SW2] presentation/project/paper/report [SW5] implementation of a problem task [SU5] implementation of a problem task [SK2] presentation/project/paper/report [SK3] text preparation/written work		

Subject contents	Definitions of biotechnology and biotechnological process. Molecular cloning and cloning of organisms. Obtaining GMOs. Tools and techniques of molecular biotechnology. Elements of biotechnological process design. Phylogenetic tree, groups of microorganisms used in biotechnology. Sources of obtaining microorganisms for biotechnological purposes. Conventional and genetically modified microorganisms. Biotechnological applications of complete microorganisms and products obtained from them, native and recombinant enzymes. Biotechnological preparations of microbiological origin - characteristics of the production process and properties of the preparation containing microorganisms or their elements. Isolation and purification of recombinant proteins. Characteristics of selected biotechnological processes using microorganisms, examples of white, green and red biotechnology: waste management, biofuels, drugs and pharmaceuticals, food, probiotics. Legal basis for the use of microorganisms and genetically modified microorganisms in biotechnology.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	character profile - Nobel Prizes and discoveries	51.0%	20.0%
	working with a DNA sequence	51.0%	20.0%
	media inspirations - biotechnology	51.0%	20.0%
	worksheet - project task	51.0%	20.0%
	inphographic - creative work	51.0%	20.0%
Recommended reading	Basic literature	The basic materials for each lecture will be provided as links and online references for the upcoming lectures. In addition, useful literature is available in both Polish and English: 1. Glick, B.R., Pasternak, J.J., Patten, C.L.: Molecular biotechnology: Principles and applications of recombinant DNA. ASM PRESS, 2009 2. Joshi VK, Singh RS: Food Biotechnology. Principles and practices. IK International Publishing House Pvt. Ltd, New Delhi, 2012 3. Klimiuk E., Łebkowska M.: Biotechnologia w ochronie środowiska, PWN, 2005 4. Libudzisz Z., Kowal K., Żakowska Z.: Mikrobiologia techniczna, tom 1, 2, PWN 2008 5. Olańczuk-Neyman K.: Laboratorium z biologii środowiska, Wyd. PG, 1998	
	Supplementary literature	6. Indicated on-line resources. 7. Berkeley RM, Heyndrickx NL, De Vos P: Applications and systematics of Bacillus and relatives. Wiley-Blackwell. Oxford, 2008 8. Chavarri M, Maranon I, Villaran MC: Encapsulation Technology to Protect Probiotic Bacteria. In Probiotics. Ch23 pp 501-540. InTech, Rijeka, - Rigobelo, 2012 http://dx.doi.org/10.5772/50046 9. Goderska K: Different Methods of Probiotics Stabilization. In Probiotics. Ch24 pp 541-550. InTech, Rijeka, Rigobelo, 2012 http://dx.doi.org/10.5772/50313	
	eResources addresses		

Example issues/ example questions/ tasks being completed	Independent decision on the level of involvement, resulting in obtaining a specific grade. Each of the components listed in the "Assessment Method" section (and given also below), counts for 0.5 of a grade. Completing all five tasks results in a grade of 5.0. One component is mandatory to pass, resulting in a grade of 3.0. Each additional element raises the grade by 0.5. 1. Example of using a selected microorganism in biotechnology (infographic - creative work) 2. Idea for a biotech product using microorganisms (worksheet - project task) 3. Profile of a person - Nobel Prizes and discoveries 4. Working with a DNA sequence 5. Media inspirations - biotechnology
Work placement	Not applicable

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