



Subject card

Subject name and code	Bio-Components in Cosmetics, PG_00064325						
Field of study	Chemical Technology						
Date of commencement of studies	February 2027		Academic year of realisation of subject			2027/2028	
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 Biotechnology and Microbiology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Martyna Mroczyńska-Szeląg				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	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		5.0		25.0	75
Subject objectives	Lecture:						
	To provide students with theoretical knowledge concerning the origin, structure, properties, and applications of biologically active ingredients used in modern cosmetic products.						
	Project:						
	The objective of the project Biocomponents in Cosmetics is to broaden students knowledge of natural active ingredients used in cosmetology, their biological properties, and their impact on the human body and skin microbiome.						
	Project practical part:						
	Students will acquire practical skills in microbiology and molecular biology, essential for assessing the safety and effectiveness of biologically active ingredients used in cosmetic products.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_K03] can interact and work in a group, taking on a variety of roles	is able to prepare, in a group, a review of scientific information and critically analyze it.	[SK1] Assessment of group work skills
	[K7_W01] defines the phenomena, processes and laws of nature used to produce consumer goods and provide services	has knowledge of the origin, properties, mechanisms of action, and applications of biologically active ingredients used in cosmetics.	[SW1] Assessment of factual knowledge
	[K7_U05] uses instrumental methods applied in technology and related fields	is able to select an appropriate methodology for specific tasks in an industrial microbiology laboratory.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K7_U02] carries out experiments using properly selected techniques and apparatus, taking advantage of new developments in technology and related fields	is able to apply molecular biology techniques appropriate for the cosmetic industry.	[SU4] Assessment of ability to use methods and tools
Subject contents	Course content – lecture The course covers an introduction to cosmetic biocomponents, including definitions, classification, and natural sources. It addresses plant-derived active ingredients, such as extracts, oils, and phytopetides, their biological properties, and applications in skin care. Biopolymers and functional components, including proteins, polysaccharides, and lipids, are analyzed in terms of their role in cosmetic formulations. The course also explores probiotics, prebiotics, and postbiotics and their effects on the skin microbiome. Enzymes and other biologically active components, their mechanisms of action, and applications in cosmetic products are discussed. Students learn about factors affecting the stability and safety of biocomponents and methods for evaluating their effectiveness. The course concludes with trends and innovations in bio-inspired cosmetics, including modern production methods and the potential of biocomponents in the cosmetics of the future.		
	Course content – project The course introduces cosmetic biocomponents, covering their definitions, classification, and natural sources. It examines plant-derived active ingredients, including extracts, oils, and phytopetides, focusing on their biological properties and applications in skin care. Biopolymers and functional components, such as proteins, polysaccharides, and lipids, are discussed in relation to their role in cosmetic formulations. The course also addresses probiotics, prebiotics, and postbiotics and their influence on the skin microbiome. Enzymes and other biologically active substances, their mechanisms of action, and applications in cosmetic products are analyzed. Students explore factors affecting the stability and safety of biocomponents and learn methods for evaluating their effectiveness. The course concludes with an overview of trends and innovations in bio-inspired cosmetics, highlighting modern production techniques and the potential of biocomponents in future cosmetic products.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Practical test (laboratory part of the project)	60.0%	12.5%
	Final test (lecture)	60.0%	50.0%
	Short tests (laboratory part)	60.0%	12.5%
	Project presentation	60.0%	25.0%
Recommended reading	Basic literature	Scientific publications related to the lecture topics	
	Supplementary literature	Depending on the project topic	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Final exam: How can you test whether a given essential oil has bactericidal properties? Short tests: Which method can be used to isolate DNA?		
Practical activities within the subject	Not applicable		

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