GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Chemistry and Nanochemistry of Cosmetics, PG_00069710		
Field of study	Nanotechnology		
Date of commencement of studies	October 2024	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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Biotechnology and Microbiology -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Patrycja Szumała	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=1136

Moodle ID: 1136 Chemia i nanochemia kosmetyków 2026/2027
https://enauczanie.pg.edu.pl/2025/course/view.php?id=1136

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	3.0	42.0	75

Subject objectives

Learning about the technology, composition and action of selected cosmetic products, with particular emphasis on ingredients with nanometric dimensions and the production of nanosystems.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W05] has knowledge of inorganic and organic chemistry, physical chemistry and chemical thermodynamics.	Identifies and characterizes basic cosmetic ingredients and cosmetic formulations, such as solutions, gels, emulsions, and others. Gains knowledge about the formation and properties of nanoparticles and nanosystems.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
[K6_U04] can plan and conduct experiments, critically analyze their results, draw conclusions and formulate opinions. Has laboratory experience.	Can produce various cosmetic formulations, including nanometric products, and analyze their basic physicochemical and sensory parameters. Can evaluate cosmetics available on the market and described in the literature.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject

Subject contents	Lecture: The structure and functions of human skin. Basic cosmetic ingredients and their functions. Pathways of cosmetic ingredient penetration into the skin. Types of cosmetic product forms and types. Basic properties, composition, action, and physicochemical parameters. Cosmetic nanomaterials and nanocarriers. Cosmetic emulsions, nanoemulsions, and microemulsions - structure, methods of preparation and stabilization. Legal regulations regarding cosmetic raw materials and products. Laboratory: Creation of selected cosmetic forms: solutions, gels, emulsions. Methods for obtaining nanosystems: micellar solutions, nanoemulsions, and microemulsions. Analysis of the basic physicochemical parameters of selected cosmetic raw materials and products.
Prerequisites and co-requisites	Basic knowledge of general chemistry

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written test	50.0%	60.0%
tests and reports	100.0%	40.0%

Recommended reading

Basic literature	1. M. Martini, Kosmetologia i farmakologia skóry, Wydawnictwo Lekarskie PZWL, Warszawa 2007 2. Heather A. E. Benson; Michael S. Roberts; Vania Rodrigues Leite-Silva, Cosmetic Formulation: Principles and Practice, CRC Press 2021 3. Dreher, F., Jungman, E., Sakamoto, K., & Maibach, H.I. (Eds.) Handbook of Cosmetic Science and Technology (5th ed.). CRC Press 2022 4. K. Uzdrowska, Recepturowanie kosmetyków i proces ich wdrożenia, PWN, Warszawa 2023
Supplementary literature	1. A. Salvador, A.Chisvert, Analysis of Cosmetic Products, Elsevier, Amsterdam, 2007. 2. W.S. Brud, R. Glinka, Technologia Kosmetyków, Oficyna Wydawnicza, Łódź, 2001. 3. R. Glinka, M. Glinka; Receptura kosmetyczna z elementami kosmetologii: tom 1; Oficyna Wydawnicza MA, Łódź, 2008
eResources addresses	

Example issues/ example questions/ tasks being completed	1. Describe the differences in properties, production, and composition between emulsions, nanoemulsions, and microemulsions. 2. What chemical compounds are used to create nanoparticles with cosmetic properties? 3. Describe the skin's barrier functions.

Work placement	Not applicable

Document generated electronically. Does not require a seal or signature.