

Subject card

Subject name and code	Organic synthesis of cosmetic components, PG_00183830						
Field of study	Synteza organiczna komponentów kosmetycznych (Ćw. laboratoryjne)						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study 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	2		Language of instruction		Polish		
Semester of study	3		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Irena Bylińska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		4.0		16.0	50
Subject objectives	The aim of the course is to familiarize students with organic components of cosmetics in the context of their synthesis, properties, and functions. Students will learn about common problems encountered in this type of research and methods for solving them, as well as be prepared for independent experimental design. The course is intended to improve students laboratory work organization skills, implement the principles of Good Laboratory Practice (GLP), and develop the ability to interpret obtained results, critically evaluate them, identify potential sources of error, and present findings in the form of a concise and objective report. In addition, students will develop the ability to search for, select, and critically analyze scientific literature sources necessary for experimental planning and data interpretation.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	The student continuously analyzes obtained results, seeks solutions through discussions with other students or the instructor, as well as by consulting scientific literature, and responds appropriately to the situation. The student is able to cooperate and work in a team, assuming various roles. They ensure work safety and adhere to established procedures for conducting experiments.	[SK1] wypowiedź ustna/rozmowa/ dyskusja [SK2] prezentacja/projekt/referat/ raport [SK5] realizacja zadania problemowego [SK8] obserwacja samodzielnej lub zespołowej pracy studenta
	[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	The student analyzes and verifies the results of conducted experiments and formulates conclusions based on them. The processed results are presented in a written report or presentation including the aim and detailed description of the experiment, applied methodology, discussion of results, and final conclusions.	[SU1] wypowiedź ustna/rozmowa/ dyskusja [SU2] prezentacja/projekt/referat/ raport [SU3] opracowanie tekstowe/ praca pisemna
	[CHEMMU2_W02] Has extended and in-depth knowledge in the field of basic chemistry.	The student is familiar with examples of organic compounds used as cosmetic components. They can name and characterize the properties and functions of selected organic compounds applied in the cosmetic industry. The student is able to plan and carry out the synthesis of an organic cosmetic component in accordance with laboratory safety and hygiene principles and Good Laboratory Practice (GLP).	[SW1] wypowiedź ustna/rozmowa/ dyskusja [SW2] prezentacja/projekt/referat/ raport [SW3] opracowanie tekstowe/ praca pisemna [SW5] realizacja zadania problemowego
	[CHEMMU2_W12] Knows the principles of occupational health and safety to the extent that allows independent work on a research and/or measurement position.	The student applies laboratory safety and hygiene principles to a degree that enables independent conduct of experiments and operation of laboratory equipment.	[SW1] wypowiedź ustna/rozmowa/ dyskusja [SW5] realizacja zadania problemowego
	[CHEMMU2_U08] Prepares and presents oral presentations in various fields of chemistry in Polish and English, using acquired knowledge and skills as well as basic sources of scientific information.	The student is able to present obtained research results and their analysis, complemented by interpretation in the context of relevant literature data.	[SU1] wypowiedź ustna/rozmowa/ dyskusja [SU2] prezentacja/projekt/referat/ raport
	[CHEMMU2_K05] Understands the need for independent search of information in scientific literature and popular science magazines.	The student is able to assess the credibility and relevance of literature sources in the context of conducted research.	[SK1] wypowiedź ustna/rozmowa/ dyskusja [SK2] prezentacja/projekt/referat/ raport
	[CHEMMU2_U01] Plans and implements chemical experiments of medium complexity.	The student independently plans, prepares, and conducts complex chemical experiments. They are capable of interpreting experimental procedures, assembling advanced glassware setups, and operating chemical instrumentation. The student follows safety regulations and applies the principles of Good Laboratory Practice (GLP).	[SU6] demonstracja umiejętności praktycznych
Subject contents	The course covers issues related to organic components of cosmetics, discussed in the context of their synthesis, properties, and functions. Students become familiar with typical problems encountered in this type of research and the methods used to solve them. During the classes, participants learn to independently plan experiments, improve laboratory work organization, and implement the principles of Good Laboratory Practice (GLP). A significant part of the course focuses on developing skills in interpreting experimental results, critically evaluating data, identifying potential sources of error, and presenting findings in the form of a concise and factual report. Additionally, students practice searching for, selecting, and critically analyzing literature sources necessary for experiment planning and interpretation of research outcomes.		

Prerequisites and co-requisites	Knowledge of organic chemistry at the undergraduate (Bachelors) level.								
	Ability to perform simple organic syntheses based on procedures written in Polish.								
	Knowledge of basic laboratory safety and hygiene principles in a chemistry laboratory.								
	Ability to perform basic chemical calculations.								
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Performance of all experiments included in the course program and presentation of their results with discussion in the form of a written report.</td><td>51.0%</td><td>100.0%</td></tr></table>	Subject passing criteria	Passing threshold	Percentage of the final grade	Performance of all experiments included in the course program and presentation of their results with discussion in the form of a written report.	51.0%	100.0%		
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Recommended reading	<table><tr><td>Basic literature</td><td>R.S. Heath, R.E. Ruscoe, N.J. Turner, The beauty of biocatalysis: sustainable synthesis of ingredients in cosmetics, Nat. Prod. Rep., 2022, 39, 335-388</td></tr><tr><td>Supplementary literature</td><td>C. Juliano, G.A. Magrini, Cosmetic Ingredients as Emerging Pollutants of Environmental and Health Concern. A Mini-Review. <i>Cosmetics</i> 2017, 4, 11</td></tr><tr><td>eResources addresses</td><td></td></tr></table>	Basic literature	R.S. Heath, R.E. Ruscoe, N.J. Turner, The beauty of biocatalysis: sustainable synthesis of ingredients in cosmetics, Nat. Prod. Rep. , 2022, 39, 335-388	Supplementary literature	C. Juliano, G.A. Magrini, Cosmetic Ingredients as Emerging Pollutants of Environmental and Health Concern. A Mini-Review. <i>Cosmetics</i> 2017, 4, 11	eResources addresses			
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Example issues/ example questions/ tasks being completed	1. Synthesis of a cosmetic active ingredient, e.g., allantoin. 2. Synthesis of an organic fragrance fixative, e.g., musk ketone. 3. Preparation of an organic cleansing agent, e.g., exfoliating/chocolate/herbal-cocoa/transparent soap. 4. Synthesis of an organic fragrance compound, e.g., Niobe essential oil.								
Work placement	Not applicable								

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