University of Gdańsk

Subject card

Subject name and code	Application of biomolecules in cosmetics, PG_00082058		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	Bachelor's studies	Subject group	Obligatory subject group 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	5	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Medical Chemistry -> Department of Biomedical Chemistry -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Julia Witkowska	
	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	5.0	15.0	50

Subject objectives

To acquaint students with the structure, application and isolation of structural components (collagen, elastin, keratin) of the human body as well as the structure and isolation of the hyaluronic composition.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEML3_W05] Has basic knowledge of the chemical specialisation studied.	Student has knowledge of the structure and function of proteins and the ability to isolate and identify them.	[SW4] test/exam - oral or written [SW3] text preparation/written work
[CHEML3_K01] Identifies the level of her/his own knowledge and skills and the need for continuous learning and personal development.	The student demonstrates independence in preparing reports and preparing for classes by using available literature and scientific articles.	[SK3] text preparation/written work [SK6] demonstration of practical skills [SK8] observation of student's independent or team work
[CHEML3_W03] Explains the relationship between the structure of matter and its observed properties.	The student uses the acquired theoretical knowledge during laboratory classes.	[SW1] oral statement/ conversation/discussion
[CHEML3_U08] Presents in an understandable way the basic facts about chemistry using a scientific language typical of chemical sciences.	The student has the ability to interpret the results of experiments and draw correct conclusions.	[SU1] oral statement/conversation/ discussion [SU3] text preparation/written work

Subject contents

- Isolation of collagen from fish skins and its molecular characterisation as a cosmetic ingredient
- Isolation of elastin from tendons and its characterisation
- Isolation of keratin from hair using microwave technology
- Isolation of hyaluronic acid from eggshells and its chemical characterisation.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>points for tests and reports from laboratory exercises</td><td>51.0%</td><td>100.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>G. Baki and Gabriella. Baki, Introduction to cosmetic formulation and technology. John Wiley and Sons Ltd, 2022. Accessed: Jun. 13, 2024

L. Dai and I. Hansenne-Cervantes, Protein-Based Materials in Cosmetics, Handbook of the Extracellular Matrix, pp. 123, 2023, doi: 10.1007/978-3-030-92090-6_18-1.

G. Secchi, Role of protein in cosmetics, Clin Dermatol, vol. 26, no. 4, pp. 321325, 2008, doi: 10.1016/J.CLINDERMATOL.2008.04.004.</td></tr>
<tr><td>Supplementary literature</td><td>M. Molski, Chemia Piękna Tom 1 . Warszawa: Wydawnictwo Naukowe PWN, 2021. Accessed: Jun. 13, 2024

A. Marzec, Chemia nowoczesnych kosmetyków - Substancje aktywne w preparatach i zabiegach kosmetycznych - Marzec, I. Dom Organizatora TNOiK, 2010.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">The structure of elastin and collagen. Allysine and cross-linking of collagen and elastin. Functions and structure of hyaluronic acid.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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