SYLLABUS

1. Course title:

Immunochemistry and Skin Immunology

2. Code:

3. Cycle of study:

I

4. ECTS credits:

5

5. Type of course:

Mandatory

6. Prerequisites:

7. Class restrictions:

8. Duration / semester(s):

1 | 4

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)
	4			
9.1. Lectures	2		Classes:	33,75
9.2. Seminars	1		Individual work:	92,24
9.3. Laboratory / Practice classes	0		In total:	125,9

10. Faculty:

Faculty of Pharmacy

11. Department/study program:

Cosmetology

12. Lecturer:

Adaleta Softić, Full Professor

13. Course aims:

To introduce students to the fundamentals of cellular and molecular immunology, the role of the immune system in maintaining skin integrity and in the development of skin diseases, as well as the specific features of immune processes in the skin. Special emphasis is placed on immune response disorders relevant to cosmetology (allergic reactions,

inflammatory skin diseases, autoimmune dermatoses), as well as on the principles and application of immunochemical methods in assessing the immunological status of the skin and in the evaluation of cosmetic products.

14. Learning outcomes:

After attending the lectures and passing the exam, students will be able to:

Understand the basic principles of the immune response at the cellular and molecular level.

Explain the role of the immune system in the function and protection of the skin.

Identify the most common immune system disorders that manifest on the skin (allergies, inflammations, autoimmune diseases).

Understand the principles of modern immunochemical methods and their application in the evaluation of immunological processes in the skin.

Critically assess the potential of immunochemical methods in the research and development of cosmetic products.

15. Course content:

1. Basics of the Immune System:
Overview of the immune system with an emphasis on the role of the skin as an immunological organ. Innate and adaptive immunity: definitions and basic mechanisms. Cells of the immune response and hematopoietic organs.

2. Molecular Mechanisms of the Immune Response:
B cell receptors and antibodies – structure and function. T cell receptors, coreceptors, and antigen presentation. Maturation, activation, and differentiation of T and B lymphocytes. Cytokines and their role in regulating immune responses. Complement system and its relevance for skin immunity. Humoral and cellular immune responses.

3. Immunological Tolerance and Homeostasis:
Central and peripheral tolerance. Mechanisms of maintaining immune balance.

4. The Skin and Immunological Challenges:
The skin as a barrier and immunologically active organ. Local immune response in the skin: Langerhans cells, keratinocytes, and dermal immune cells. Allergic reactions to cosmetic products (contact dermatitis, urticaria). Inflammatory skin diseases (e.g., atopic dermatitis, psoriasis). Autoimmune dermatoses (e.g., vitiligo, lupus). Cutaneous manifestations of immunodeficiencies.

5. Immunochemical Methods in Dermatological and Cosmetological Practice:
ELISA and related techniques (e.g., xMAP, ELISPOT). Immunofluorescence and immunohistochemistry in skin tissue analysis. Agglutination and precipitation – basic principles. Flow cytometry – role in immunological analyses.
Western blot – application in skin protein detection. Techniques for assessing effector cell function. Methods for isolation and analysis of skin lymphocytes.

6. Application of Immunological Knowledge in Cosmetology:
Evaluation of the immunological safety of cosmetic products. Sensitization and immunotoxicity testing. Use of antibodies and immunotherapy in dermatological and aesthetic medicine. Basics of immunoprophylaxis in the context of skin health. The immune system and skin tumors.

16. Learning methods:

Lectures, exercises, consultations, and independent seminar work.
Teaching is conducted through lectures and classroom exercises.
Students are required to attend both lectures and exercises and to actively participate in discussions, based on the knowledge acquired during theoretical instruction.

17. Assessment methods:

Knowledge assessment will be conducted through pre-exam obligations and a final exam.
Pre-exam obligations consist of two midterm exams, one quiz, a seminar paper, class attendance, and active participation during lectures.
The first midterm exam is held during the 9th week of classes and covers the material presented in the first eight weeks of lectures.
The second midterm exam and the quiz are conducted during the 15th week and cover material from weeks 10 to 14, based on the content presented in lectures (midterm) and exercises (quiz).
The final exam is taken during the regular exam periods and includes only those components (midterms and quiz) that the student did not pass as part of the pre-exam obligations or in which they did not achieve the required minimum number of points.

A student who passes both midterm exams and the quiz, and defends their seminar paper, achieving a total of 54–100 points within the pre-exam obligations, has the right to have the final grade recorded during the first regular exam period.

The final grade is calculated as the sum of points earned from the two midterm exams, the quiz, attendance, and active participation during lectures.

Final grade composition:
For regular attendance at lectures, a student may earn a maximum of 5 points.
For continuous participation in teaching activities, a student may earn a maximum of 5 points.
The first midterm exam carries 35 points. The minimum required is 21 points.
The second midterm exam carries 35 points. The minimum required is 21 points.
The colloquium carries 10 points. The minimum required is 6 points.

Points distribution (minimum – maximum):

Regular lecture attendance:	**0–5 points**
Active participation in class:	**0–5 points**
First midterm exam:	**21–35 points**
Second midterm exam:	**21–35 points**
Colloquium:	**6–10 points**
Seminar paper:	**6–10 points**
TOTAL:	**54–100 points**

18. Assessment components:

Grading scale:
Less than 54 points = 5 (Fail)
54–64 points = 6 (Sufficient)
65–74 points = 7 (Good)
75–84 points = 8 (Very good)
85–94 points = 9 (Excellent)
95–100 points = 10 (Outstanding)

19. Mandatory reading list:

1. Abbas, AK, Lichtman, AHH, Pillai, S. Osnovna imunologija, šesto izdanje, Data Status 2019.
2. A. Softić, Imunohemijske tehnike, Soreli, Tuzla, 2017.

20. Additional reading list:

21. Web sources:

22. Applicable from the academic year:

2025/26.

23. Adopted in the Faculty/Academy session: