SYLLABUS

1. Course title:

Cell biochemistry

2. Code:

(max. 20 characters)

3. Cycle of study:

1

4. ECTS credits:

2

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

1 8

9. Weekly contact hours:

9.1. Lectures: 2

9.2. Seminars: 0

9.3. Laboratory/Practice classes: 0

10. Faculty:

Faculty of Pharmacy

11. Department/study program:

Pharmacy (integrated 1st and 2nd cycle)

12. Lecturer:

Ph.D. Aida Smajlović, full professor

13. Lecturer's e-mail:

aida.smajlovic@untz.ba

14. Web site:

www.frmf.untz.ba

15. Course aims:

The aim of this course is to acquire knowledge about the fundamental relationship between the structure and function of membrane proteins. Investigate the molecular mechanisms involved in signal transmission and the ability to modulate signal pathways for therapeutic purposes. To gain knowledge about the structure of secretion vesicles, cell signal transmission, signal transduction in the vessel, nuclear pore structure, ways and control of cellular motion and shape, cell cycle regulation and cellular cells and multicellularity, programmed cell death, and the ability to apply animal cell cultures to For research and laboratory purposes.

16. Learning outcomes:

- acquire theoretical knowledge of the relationship between the structure and function of integral membrane proteins involved in different types of membrane transport through the membrane, in order to modulate signal pathways for therapeutic purposes.
- acquire theoretical knowledge of signal transmission through the sail, cell cycle regulation, cell shape and mobility, cellular cells and the concept of multicellularity.
- become acquainted with the application of animal cell cultures in order to efficiently apply these systems for research and diagnostic purposes

17. Course content:

- Dynamics, structure and organization of biological membranes. Cytoskeleton. Extracellular matrix.
- Types of transport through the membranes. Sorting proteins into membranes and organelles.
- Cell signal transmission or transduction of small molecules and ions
- Signal transmission in the nucleus, nuclear dust, chromatin
- Mobility of the cell (actin, myosin) and control of the cellular shape
- Cell cycle regulation of protein kinases
- Cell stem cells, cell death, multicellularity
- Oncogene. Tumor suppressor genes and programmed death cells.
- Possibilities of application of animal cell cultures as well-defined live sequences for research and diagnostic purposes.
- Seminar papers. Mini Symposium (Cell biochemistry)

18. Learning methods:

Lectures, seminar papers
Teaching subjects. The cell biochemistry has a fund of 30 hours of theoretical instruction and seminars.
Students are obliged to attend lectures and participate actively in them through discussion.
Seminar work is mandatory as a team team project.

19. Assessment methods:

Knowledge verification will be done through pre-examination tasks and the final exam. Pre-examination obligations consist of one test, individual/group seminar work, regular attendance and lecture activities. The test is carried out in the 13th week of classes and includes the material, which is covered during the semester at the lecture. During 14th and 15th weeks of the semester, the student is required to do a seminar work independently or as a group project. The final exam is taken on the regular exam dates and includes the test that the student did not pass as part of the pre-exam obligations, i.e. did not achieve the required minimum points. A student who passes the test (minimum 42), achieves the appropriate number of points from the seminar work (minimum 9 points) and the appropriate number of points based on regular attendance of classes and class activities (minimum 2 points for both bases), which is a total of 55-100 points within the framework of the pre-examination obligations acquires the right to enter a grade on the first regular exam period.
Point value of knowledge checks (min-max):

Regular class attendance	2-5
Class activity	2-10
Seminar paper	9-15
Test	42-70
TOTAL	55-100

20. Assessment components:

< 55 5 (F, FX) - does not meet the minimum criteria
55-64 6 (E) - meets the minimum criteria
65-74 7 (D) - generally good, but with significant shortcomings
75-84 8 (C) - average, with noticeable errors
85-94 9 (B) - above the average, with some errors
95-100 10 (A) - outstanding performance without errors or with minor errors

21. Required reading list:

1. Softić A, Smajlović A, Srabović N Ćelijske kulture u biohemijskim istraživanjima, Tuzla, 2021
2. Lehninger A L, Nelson D L, Cox M M, Principles of Biochemistry, New York, 2005.a

22. Web sources:

23. Applicable starting from the academic year:

2023/2024.

24. Adopted in the Faculty/Academy session:

17.11.2025.