# SYLLABUS

**1. Course title:**

PROTEOMICS

**2. Code:**

**3. Cycle of study:**

1

**4. ECTS credits:**

5

**5. Type of course:**

(•) Mandatory ( ) Elective

**6. Prerequisites:**

none

**7. Class restrictions:**

**8. Duration / semester:**

1 6

**9. Weekly contact hours:**

| | |
|---|---|
| 9.1. Lectures: | 2 |
| 9.2. Seminars: | 0 |
| 9.3. Laboratory/Practice classes: | 2 |

**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 goal of this course is to acquire knowledge about the chemical aspect of proteins, methods used in protein research, application of recombinant DNA technology in protein engineering, biochemical and biophysical analyzes of recombinant proteins.
To acquire the basic knowledge about bioinformatics and the possibilities it provides in protein research.

**16. Learning outcomes:**

Knowledge related to protein research and analysis. Protein isolation from biological material, protein detection, post-translational modifications, protein interactions, structural perturbations, protein targeting and localization. Knowledge of the application of recombinant DNA technology in protein engineering. Mastering methods of protein separation from biological material and electrophoretic methods in protein characterization. Basic knowledge in bioinformatics and the possibility of their application in the identification and quantification of proteins with the aim of understanding the origin of diseases and designing drugs.

**17. Course content:**

Introduction to proteomics. Protein folding and stability. Post-translational modifications. Intracellular protein targeting. Designing a procedure for protein purification from biological material. Methods of quantitative evaluation of the protein separation procedure. Chemical synthesis of peptides and small proteins using an automatic method on solid phase. Mass spectrometry in protein identification and characterization. Design of recombinant proteins and their expression. Recombinant DNA techniques in the production of recombinant proteins. Protein sequencing strategy and protein sequence analysis. Protein databases for primary and three-dimensional structure (PDB, UniProt, Swiss-Prot). Introduction to bioinformatic sequence analysis. Search of similar sequences and their alignment - BLAST (Basic Local Alignment Search). Visual display of protein structure (RasMol, PyMol, JMol).

**18. Learning methods:**

Proteomics has a pool of 60 hours: 30 hours of lectures and 30 hours of laboratory exercises. Classes are conducted in the form of lectures, practical exercises and seminars.

**19. Assessment methods:**

Knowledge verification will be done through pre-examination tasks and the final exam. Pre-examination duties consist of lecture activities, exercise activities, colloquium, test and seminar work. During the semester, the student is required to do a seminar work independently or as a group project. The test and the colloquium take place in the 15th week of classes and include material covered during the semester in lectures and exercises. The final exam is taken on the regular exam dates and includes a test and a colloquium, which the student did not pass as part of the pre-exam obligations, i.e. did not achieve the minimum number of points. A student who passes the test and the colloquium with a total of 55-100 points as part of the pre-examination requirements acquires the right to enter the grade on the first regular exam period.

Point value of knowledge checks (min-max):

| | |
|---|---|
| Activity during the lecture | 2,5-5 |
| Activity during the lecture | 2,5-5 |
| Colloquium | 18-30 |
| Test | 28-50 |
| Seminar work | 4-10 |
| | |
| 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. Smajlovic A, Eksperimentalna biohemija, Off-set, Tuzla, 2015
2. Lehninger A L, Nelson D L, Cox M M, Principles of Biochemistry, Worth Publishers, New York, 2005.

**22. Web sources:**

**23. Applicable starting from the academic year:**

2018/19

**24. Adopted in the Faculty/Academy session:**

17.11.2025.