SYLLABUS

1. Course title:

BIOCHEMISTRY OF PROTEIN

2. Code:

3. Cycle of study:

1

4. ECTS credits:

3

5. Type of course:

○ Mandatory ◉ Elective

6. Prerequisites:

No

7. Class restrictions:

8. Duration / semester:

1 5

9. Weekly contact hours:

9.1. Lectures:	2
9.2. Seminars:	0
9.3. Laboratory/Practice classes:	1

10. Faculty:

PHARMACY

11. Department/study program:

Pharmacy (integrated I and II cycle)

12. Lecturer:

Dr. sc. Selma Berbić, assoc. prof.

13. Lecturer's e-mail:

selma.berbic@untz.ba

14. Web site:

15. Course aims:

Since the pharmaceutical biotechnology products mainly proteins, the goal of the course become familiar with the chemical aspect of the protein, methods which are used in protein research, application of recombinant DNA technology in the protein engineering, biochemical and biophysical analyzes of the recombinant protein.

16. Learning outcomes:

Knowledge regarding the experimental approach to research and analysis of proteins related to the isolation of proteins from biological material, structural characterization of protein, protein stability testing.
Knowledge of the application of recombinant DNA technology in protein engineering.
Master basic experimental method, related to the fractionating of proteins from biological materials and by electrophoretic methods in the characterization of protein.

17. Course content:

Proteins: structure and composition. Structural levels of the protein molecule. The ionic forms of the protein molecule. Changing ionization of protein, depending on the pH. Protein folding. The stability of proteins. Bending characterization techniques: circular dichroism (CD), fluorescence spectroscopy, FTIR. Protein purification. Design of the purification method (purification) of the protein from the biological material. Quantitative evaluation of the protein purification procedure. Strategy sequencing proteins. Chemical synthesis of peptides and small proteins automatic solid phase method. Mass spectrometry to identify the characterization of proteins. Recombinant proteins. Designing recombinant proteins: point mutants; fusion proteins. The expression of recombinant proteins. Techniques of recombinant DNA technology in the production of recombinant proteins. The fusion of antibody-biopharmaceuticals. Immunochemical techniques in the study of proteins. Production of monoclonal antibody hybridoma technique.

18. Learning methods:

Protein biochemistry has a fund of 45 hours: 30 hours of lectures and 15 hours of laboratory exercises. Teaching is carried out in the form of lectures, practical exercises and seminars.

19. Assessment methods:

Assessment of skills and the acquisition takes place through continuous assessment, colloquium and a final examination, which is written (test) and includes the whole material theoretical classes. At the colloquium and final exam are used written forms of knowledge testing: test, essay, test issues with entering the required response.

Colloquium consists of a test with questions and tasks of different types. Open questions 1.5 point, questions with multiple answer 1 point; questions circle the correct answer 0.5 points; question essay that relates to the experimental procedure of laboratory work and its interpretation 3.0 points.

The final exam is a test of knowledge of theoretical instruction. The final exam is written and consists of questions in the form of essays, issues with entering the required answers and their interpretation, entering data on the nameplate of the schematic presentation of the process.

20. Assessment components:

Lecture (L): presence to all classes: 5 points the presence of > 95% : 2 points
Exercises (LE): mandatory presence on all exercises (100%); Activity on exercises: maximum 5; minimum 2 points.
Colloquium I: maximum 15 points; at least 8 points
Colloquium II: maximum 15 points; at least 8 points.
Theory course (test): maximum 50 points; minimum 33 points
Seminar (optional): 10 points

21. Required reading list:

1. Lehninger A L, Nelson D L, Cox M M, Principles of Biochemistry, Worth Publishers, New York, 2005.
2. Stryer L, Biochemistry, W. H. Freeman and Company, New York, 1995.
3. Crommelin D, Sindelar R, Pharmaceutical Biotechnology, Harwood Academic P

22. Web sources:

23. Applicable starting from the academic year:

2012/13

24. Adopted in the Faculty/Academy session: