SYLLABUS

1. Course title:

Pharmaceutical chemistry I

2. Code:

3. Cycle of study:

1

4. ECTS credits:

9

5. Type of course:

(●) Mandatory ( ) Elective

6. Prerequisites:

NONE

7. Class restrictions:

NONE

8. Duration / semester:

1 5

9. Weekly contact hours:

9.1. Lectures:	4
9.2. Seminars:	0
9.3. Laboratory/Practice classes:	4

10. Faculty:

Faculty of pharmacy

11. Department/study program:

Pharmacy (Integrated study I and II cycle)

12. Lecturer:

Dr.sc. Amra Džambić, assistant professor

13. Lecturer's e-mail:

amra.dzambic@untz.ba

14. Web site:

www.frmf.untz.ba

15. Course aims:

Students will acquire basic knowledge of pharmaceutical chemistry, which they will apply to mastering Pharmaceutical Chemistry II and other specialized subjects. The student will gain fundamental knowledge of the physicochemical properties of pharmacologically active molecules, the reactivity of their functional groups, mechanisms of drug action, the structure-activity relationship (QSAR), chemical drug interactions, drug-receptor interactions, and drug metabolism reactions (in vivo and in vitro).

16. Learning outcomes:

- acquiring knowledge about the physical and chemical properties of pharmacologically active molecules,
-understanding the basic mechanisms of drug action
-ability to analyze the relationship between chemical structure and properties, effects and selectivity of substances for pharmaceutical use
-understanding the chemical aspects of drug metabolism
-understanding and analysis of the basic mechanisms of drug action from the studied pharmacotherapeutic groups
-understanding and analysis of chemical drug interactions.

17. Course content:

Introduction to pharmaceutical chemistry, Research and development of new drugs, The relationship between molecular structure and biological activity, physicochemical properties of drugs, FG, solubility, pKa, lipophilicity, chemical stability. Stereochemistry and biological activity, isosteres and bioisosteres, modifications of functional groups, prodrugs. Metabolism, phase I, Cyt P 450, oxidation reactions, reduction reactions, phase II metabolism, first-pass metabolism, extrahepatic metabolism. Disinfectants and antiseptics, Iron preparations in the therapy of anemia, Calcium preparations, Acidics and alkalotics, Cytostatics, Cytostatic antimetabolites; Cytostatics that act on structural proteins; Cytostatics – hormonal therapy and drugs associated with hormones; Cytostatics – inhibitors of various enzymes; Antiseptics and disinfectants, Antivirals, Antibacterial drugs (synthetic antibacterial drugs and antibiotics), Quinolones and fluoroquinolones; Nitro compounds; Sulfonamides; Methenamine, Antibiotics that inhibit cell wall synthesis.

18. Learning methods:

Lectures - mandatory attendance
Interactive classes - active participation during lectures, review of material, solving specific problems and cases, simulation of exam tests.
Computer exercises - drawing structures, searching the Merck Index, calculating physicochemical parameters of substances for pharmaceutical use.
Experimental exercises - demonstrative reactions on specific functional groups
Seminar papers - on an assigned topic

19. Assessment methods:

Laboratory exercises (I and II colloquium); - laboratory exercises: Auditory exercises: physicochemical properties of functional groups, Heterocycles, Metabolism and metabolic stability of drugs, Bioisosteres, Prodrug, Lipophilicity Practical exercises: Reagents and preparation, Test reactions for Functional groups of drugs, Lipophilicity, theoretical and practical calculation of Log P. Test – Written and/or oral exam I partial exam: checking knowledge of physicochemical properties of drug functional groups, Stability and degradation reactions, Metabolism and metabolic stability of drugs, quantitative structure-activity relationship of drugs (QSAR), Bioisosteres, Prodrug, Lipophilicity. I partial II partial exam: checking knowledge of teaching units Disinfectants, Antiseptics, Acidotics and alkalotics, Iron and Calcium preparations, Cytostatics, Antibiotics, Antivirals, Antiparasitics, Antituberculosis agents, Antifungals, Antiparasitics, Steroid hormones, Thyroxine, Thionamides, Insulin, oral antidiabetics, Vitamins and Coenzymes. Second partial exam. Seminar paper

20. Assessment components:

The exam grade is based on the total number of points that the student has earned by fulfilling the pre-exam requirements and taking the exam, it contains a maximum of 100 points, and is determined according to the following scoring scale: Seminar paper: 3-6; Laboratory exercises (interviews and actual): 10-14; Test I: 21-40; Test II: 21-40
Total:
10 (A) - 95-100 points,
9 (B) - 85-94 points,
8 (C) - 75-84 points,
7 (D) - 65-74 points;
6 (E) - 55-64 points,
5 (F) - less than 55 points.

21. Required reading list:

Farmaceutska hemija II dio. S Vladimirov, D. Živanov Stakić; Farmaceutski fakultet Beograd
William Foye, Thomas Lemke, David Williams; Principles of Medicinal Chemistry, V ed, 2002, Willams & Wilkins, Baltimore, USA

22. Web sources:

William Foye, Thomas Lemke, David Williams; Principles of Medicinal Chemistry; , Willams & Wilkins, Baltimore, USA
Textbook of Organic medicinal chemistry

23. Applicable starting from the academic year:

2018/19

24. Adopted in the Faculty/Academy session:

17.11.2025.