SYLLABUS

1. Course title:

ANALYTICAL 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 2

9. Weekly contact hours:

9.1. Lectures:	4
9.2. Seminars:	2
9.3. Laboratory/Practice classes:	3

10. Faculty:

Faculty of Pharmacy

11. Department/study program:

Pharmacy (integrated first and second cycle of study)

12. Lecturer:

dr. sc. Mirsad Salkić

13. Lecturer's e-mail:

mirsad.salkic@untz.ba

14. Web site:

www.frmf.untz.ba

15. Course aims:

- theoretical basics of qualitative chemical analysis related to types of reactions in different media,
- practical basics through laboratory work,
- numerical solution of analytical problems.

16. Learning outcomes:

- principles of chemical balance in aqueous solutions of acids, bases, salts, poorly soluble compounds, complex compounds and redox systems,
- solving qualitative problems by applying appropriate chemical principles and theories,
- application of cation and anion separation methods,
- basics of distribution between phases in extraction and chromatographic separation methods,
- solving tasks in analytical chemistry, as well as solving problems through laboratory exercises.

17. Course content:

Introduction to Analytical Chemistry. Qualitative analysis. Classification of qualitative data analysis methods. Sampling and sample preparation. Chemical reactions in analytical chemistry. Equilibria in solutions of weak and strong acids and bases. Equilibria in solutions of weak and strong acids and bases. Calculation of successive and total equilibrium constants, pH of solutions. Constructing distribution diagrams. Titration diagrams. Buffers. Buffer capacity. Ampholites. Salt solutions. Hydrolysis of soluble salts. Complexation. Equilibria in complex solutions, successive and overall stability constants. Deposition. Factors affecting deposition. Fractional precipitation Redox reactions. Factors affecting the electrode potential. Separation methods; extraction. Ion exchange. Basics of chromatographic separation. Gas, HPLC and ion exchange chromium. Fundamentals of spectral methods in qualitative analysis. UV/VIS; spectra and qualitative data analysis.

18. Learning methods:

- lectures with active participation and discussions of students,
- auditory exercises
- laboratory exercises.

19. Assessment methods:

After the first third of the semester, students take a written test (the first intermediate exam) that covers the topics covered up to that point in the lectures and exercises. The test consists of tasks and questions from theory. A student can achieve a maximum of 20 points on the first intermediate exam. After the second third of the semester, students take a written test (second midterm exam) that covers the topics covered in lectures and exercises from this part of the semester. The test consists of tasks and questions. A student can obtain a maximum of 20 points on the second intermediate exam. For continuous activity in lectures and exercises during the entire semester, a student can earn a maximum of 20 points. After the end of the semester, students take a written final exam that includes the remaining covered topics from the lectures. The test consists of theory questions. The maximum number of points that a student can obtain on the final exam is 20.
Tests on all forms of knowledge are recognized as a cumulative exam if the achieved result is positive after each individual test.
To pass the course, the student must obtain a minimum of 55 cumulative points.

20. Assessment components:

The grade on the exam is based on the total number of points a student earned by fulfilling pre-exam obligations and taking the exam, according to the quality of acquired knowledge and skills. It contains a maximum of 100 points and is determined according to the following scale:

Student obligations	Points
Attendance at a lecture	10
Colloquium	20
Lab exercises	10
Tests	40
Final exam	20

21. Required reading list:

1. Skoog D. A., West D. M., Holler F. J. (1999). Osnove analitičke hemije. Zagreb: Školska knjiga.
2. Savić J., M. Savić M. (1990). Osnove analitičke hemije. Sarajevo: Svetlost.
3. Harris D. C. (1999). Quantitative Chemical Analysis. New York: W.H.

22. Web sources:

23. Applicable starting from the academic year:

2023/24

24. Adopted in the Faculty/Academy session:

17.11.2025.