SYLLABUS

1. Course title:

MATHEMATICS

2. Code:

3. Cycle of study:

1

4. ECTS credits:

5

5. Type of course:

(•) Mandatory ( ) Elective

6. Prerequisites:

7. Class restrictions:

8. Duration / semester:

1 1

9. Weekly contact hours:

9.1. Lectures:	3
9.2. Seminars:	2
9.3. Laboratory/Practice classes:	0

10. Faculty:

Faculty of Pharmacy

11. Department/study program:

Pharmacy (integrated first and second cycle of study)

12. Lecturer:

dr.sc. Zehra Nurkanović, full professor

13. Lecturer's e-mail:

zehra.nurkanovic@untz.ba

14. Web site:

www.frmf.untz.ba

15. Course aims:

To learn mathematical concepts and methods necessary for the student's further professional work, to train the student in logical and visual thinking, and to create prerequisites for creative problem-solving.

16. Learning outcomes:

After completing the course, the student will be able to:
• Develop a sense of deductive reasoning;
• Master the criteria for testing convergence in various limit processes and methods for determining limit values;
• Gain an understanding of the role of linearization in mathematical modeling;
• Master the techniques of differential calculus for functions of a single real variable;
• Through examples from mathematics, physics, natural, and social sciences, recognize the potential of differential and integral calculus in solving real-world problems.

17. Course content:

Elementary algebra. Percentage calculus and proportion calculus. Mathematical logic. Assemblies. Real and complex numbers. Matrices. Determinants. Systems of linear equations. Vector algebra. Ordinary differential equations: some equations of the first order, linear equations of higher order with constant coefficients. Functions of several variables: Partial derivatives, extreme values. The method of least squares. Elements of integral calculus: Integration as the inverse operation of differentiation. Integration rules and techniques. Definition of definite integral, geometric and physical interpretation. Newton-Leibnitz formula. Application of integrals: Area and volume, movement, numerical integration. Elements of differential calculus: limes, continuity, degree and rate of change, the slope of a curve, definition and interpretation of derivatives, rules of differentiation. Application of derivatives: monotonicity, convexity, approximation of a function with a Taylor polynomial. Functions: definition, basic properties, domain, codomain, inverse function.

18. Learning methods:

The following activities are planned to support effective learning: concrete experience, observation and reflection, and the creation of abstract concepts.Preferred learning styles include: visual, logical-mathematical, and independent learning styles.The most important learning methods in this course are:Lectures using active learning techniques, with active student participation and discussion;Auditory exercises;Individual work on specially selected assignments in the form of homework.

19. Assessment methods:

During the semester, two knowledge assessments are conducted through tests (Test 1 and Test 2).
Test 1 is administered after covering the first third of the course material, and Test 2 after covering the second third.
These tests contain only problem-solving tasks and are worth 30 points each (a total of 60 points).

After completing the course, students who have earned at least 30 points may take the final exam, which includes problem-solving tasks from the last third of the course material and theoretical questions covering the entire syllabus.
The final exam carries a total of 40 points.

If a student has not earned the minimum number of points, they may retake either Test 1 or Test 2 during the final examination period.
The exam is considered passed if the student has achieved more than 55 points in total from all assessment components.

The make-up exam includes retaking Test 1, Test 2, or the final exam. If the student achieves a higher score than previously, the new score will be recorded.

20. Assessment components:

The final grade is based on the total number of points the student has earned through pre-exam activities and the final exam, reflecting the quality of acquired knowledge and skills. The maximum number of points is 100, and the grade is determined according to the following scale:

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

21. Required reading list:

1. M. Nurkanović i Z. Nurkanović, Elementarna matematika – Teorija i zadaci, Printcom, Tuzla, 2010.
2. Sabahet Drpljanin: Matematika, Tuzla, 1997.
3. Mehmed Nurkanović, Omer Kurtanović: Matematika za ekonomiste, Printcom, Tuzla, 2013.

22. Web sources:

http://www.mathos.unios.hr/images/uploads/260.pdf
http://www.mathos.unios.hr/ptfstatistika/00_statistika.pdf

23. Applicable starting from the academic year:

2018/2019

24. Adopted in the Faculty/Academy session:

17.11.2025.