SYLLABUS

1. Course title:

APPLIED MATHEMATICS

2. Code:

LRUDPRMA

3. Cycle of study:

1

4. ECTS credits:

5

5. Type of course:

Mandatory

6. Prerequisites:

No

7. Class restrictions:

No

8. Duration / semester(s):

1 2

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)	
9.1. Lectures	3			Classes:	56,25
9.2. Seminars	2			Individual work:	89,00
9.3. Laboratory / Practice classes	0			In total:	145,25

10. Faculty:

Mining, Geology and Civil Engineering

11. Department/study program:

Mining Engineering

12. Lecturer:

Faculty of Science and Mathematics Tuzla

13. Course aims:

The goal is to acquire fundamental knowledge in the area of advanced mathematics, master the basics of calculus and its applications in mechanics, geometry, and technical disciplines, as well as learn approximate solutions to equations and the basics of interpolation and statistics.

14. Learning outcomes:

At the end of the semester/course, successful students who have continuously completed their obligations throughout the entire teaching period will be equipped to:

- **Gain knowledge in new areas that they have not studied before.**
- **Broaden their perspectives and understanding in certain areas of advanced mathematics.**
- **Master some applications of differential and integral calculus in physics, geometry, and technical sciences.**
- **Learn some applications of numerical mathematics and statistics.**

15. Course content:

The topics covered in this course include:

- **Sequences of real numbers**
- **Functions of real variables**
- **Limit and continuity of a function**
- **Derivatives and differentials of first and higher-order functions**
- **Applications of derivatives and differentials**
- **Fundamental theorems of differential calculus**
- **Investigating the behavior and graph of a function**
- **Indefinite integral and common types of integration**
- **Definite integral, geometric meaning, and applications**
- **Improper integrals**
- **Basic types of differential equations of the first and second order**
- **Elements of numerical analysis – methods of tangents and secants, least squares method**
- **Introduction to statistics.**

16. Learning methods:

Direct presentation by the instructor on the teaching topic, interactive work with students during the creation of examples and exercises.

17. Assessment methods:

For students attending the course, the knowledge assessment includes taking two tests according to the scheduled dates during the semester. The course instructor monitors student activity and attendance. After the completion of lectures for the semester, students take the final exam.

18. Assessment components:

The total number of points is obtained by summing the maximum possible points from all activities during the semester:

- **Attendance in lectures: 5 points**
- **Attendance in exercises: 5 points**
- **Test I: 20 points**
- **Test II: 20 points**
- **Pre-exam obligations: 50 points**
- **Final exam: 50 points**

Total: 100 points

The final grade after all forms of knowledge assessment is evaluated and graded according to a system comparable to the ECTS grading scale as follows:

a) 10 (A) - outstanding success with no errors or with minor errors, corresponding to 95-100 points;
b) 9 (B) - above average, with a few errors, corresponding to 85-94 points;
c) 8 (C) - average, with noticeable errors, corresponding to 75-84 points;
d) 7 (D) - generally good, but with significant deficiencies, corresponding to 65-74 points;
e) 6 (E) - meets the minimum criteria, corresponding to 54-64 points;
f) 5 (F, FX) - does not meet the minimum criteria, less than 54 points.

19. Mandatory reading list:

1. R. Vugdalić, Matematika-Diferencijalni i integralni račun realne funkcije jedne realne promjenljive, Teorija i zadaci, Tuzla, 2009.
2. B. P. Demidovič (i grupa autora), Zadaci i riješeni primjeri iz više matematike s primjenom na tehničke nauke, Moskva 1963., prijevod sa ruskog : Tehnička knjiga Zagreb.

20. Additional reading list:

21. Web sources:

22. Applicable from the academic year:

2025/26

23. Adopted in the Faculty/Academy session: