SYLLABUS

1. Course title:

Mathematics II

2. Code:

3. Cycle of study:

1

4. ECTS credits:

6

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

10. Faculty:

Faculty of Mechanical Engineering

11. Department/study program:

All

12. Lecturer:

dr. sc. Samra Sadiković, assistent professor

13. Lecturer's e-mail:

samra.sadikovic@untz.ba

14. Web site:

www.pmf.untz.ba

15. Course aims:

-obtain needed knowledge from integral calculus of one variable functions with applications in geometry
-acquire elementary knowledge from the field of functions with more than one variable and the application of it on solving extremal problems
-obtain needed knowledge from integral calculus of function with more than one variable and develop a sense in students for logical and visual understanding of phenomena, problems and figures in space
-gain elementary knowledge about the theory of differential equations

16. Learning outcomes:

- calculating various forms of integrals of functions with one variable with applications in calculating the area of 2D figures, length of the arch of a curve, aswell as volume and complanation of rotating surfaces.
- solving various problems about determining extreme values of a function with more than one variable
- calculating the multiple integral and areas and volumes of various surfaces of the second order
- recognizing and solving various forms of differential equations of the first and second order
- faster learning of knowledge from other subjects, mainly Mathematics III

17. Course content:

Numerical series. Basic criteria for convergency and the summability of numerical series.
Integral calculus of functions with one variable with its applications (the concept of an indefinite integral, integration by substitution and integration by parts, the integration of rational, irrational and trigonometric functions. The definite integral and applications in geometry. Improper integral).
Functions with more than one variable (limit values, continuity and differentiability with application in solving extremal problems).
Multiple integrals (the definition of a multiple integral and properties of integrable functions. The concept of a double integral and two iterated integrals, calculating the double integral, the concept of Jacobian's determinant, integration by substitution in a double integral, application in calculating the areas of 2D figures and volumes of bodies. The triple integral: concept, calculation, integration by substitution and applications in calculating the volume of a body.)
Basic theories of differential equations (Solving linear differential equations of the first and second order. General theory of linear differential equations of the n-th order).

18. Learning methods:

The most significant methods of learning are: - Lectures and the technique of active studying with active participation and discussion of students.- Lectures with the use of multimedial devices.- Theoretical lessons where students solve exercises problems independently or with the help of a teaching assistant.The following activities of succesful learning are planned: observation and deliberation, creating abstract concepts and generalization. Planned styles of learning: logical-mathematical, visual, auditory and verbal.

19. Assessment methods:

After the first half of the semester students are taking Test 1 with tasks including the covered teaching material up to that time. It consists of 5 tasks by 5 points, a total of 25 points. At the end of the semester students are taking Test 2 with tasks including the covered teaching material from the second part of the semester. It consists of 5 tasks by 5 points, a total of 25 points. Both tests are taken by all students on the subject at the same time, to achive equality of the knowledge being tested and of the conditions in which the test is taken. Students take the final exam in writing form by answering four questions. The exam is considered passed if the student answers correctly on three questions. The final exam carries a maximum of 50 points. Testing of all parts of the exam knowledge are accepted as a cumulative exam.
The exam is considered passed if the student wins at least 54 cumulative points. A student, who does not make the minimum points, takes the make-up exam, at which he/she can correct each of before mentioned parts of the exam. The make-up exam is considered passed if the student wins at least 54 cumulative points.

20. Assessment components:

The exam mark is based on the total amount of points the student has gained by doing pre-exam tasks and by doing the exam, and also based on the quality of gained knowledge and skills. The grade contains a maximum of 100 points, and it is determined based on the following rating scale:
-Test 1- from 0 to 25 points
-Test 2- from 0 to 25 points
-The final exam- from 0 to 50 points.

21. Required reading list:

1. F. Vajzović, M. Malenica, Integralni račun funkcija više promjenljivih, Univerzitetska knjiga, Sarajevo, 2002.
2. E. Duvnjaković, Dž. Burgić, Zbirka zadataka iz više matematike, Grin, Gračanica, 1996.

22. Web sources:

www.mf.untz.ba

23. Applicable starting from the academic year:

2015/2016

24. Adopted in the Faculty/Academy session:

01.06.2015