

Tárgytematika / Course Description Mathematics 2

GKNB_MSTA008

Tárgyfelelős neve /

Teacher's name: dr. Harmati István Árpád

Félév / Semester: 2024/25/2

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 2/2/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

The aim of the course is to introduce the basic notions and methods of calculus of one and two-variate functions, such as differentiation and its applications, methods of integrations and their applications. Moreover, the course provides a brief introduction to differential equations and linear algebra as well. of the course is to introduce the basic notions and methods of calculus of one and two-variate functions, such as differentiation and its applications, methods of integrations and their applications. Moreover, the course provides a brief introduction to differential equations and linear algebra as well.

TANTÁRGY TARTALMA / DESCRIPTION

Week 1: Implicit curves. Implicit differentiation. Tangent line and linearization.

Week 2: Parametric curves on the plane. Differentiation of parametric curves. Tangent line, linearization. Length of arches.

Week 3: Integration of rational functions, method of partial fractions.

Week 4: Integration by substitution

Week 5: Improper integrals

Week 6: Notion and classification of differential equations. Solution of separable differential equations. Solution of first-order linear differential equations.

Week 7: Solution of first and second-order linear differential equations with constant coefficients.

Week 8: Multivariate functions. Contour curves. Partial derivatives, gradient.

Week 9: Directional derivative of functions with two variables. Equation of tangent plane. Local extreme values of multivariate functions.

Week 10: Notion of a double integral. Computation of double integrals over rectangular and normal domains. Determination of volume and center of mass by applying double integrals.

Week 11: Notion of matrix. Operations on matrices. The notion of determinant and its computation.

Week 12: Solution of system of linear equations by Gauss elimination. Matrix inverse and its computation by Gauss-Jordan elimination.

Week 13: Linear transformations. Eigenvalues, eigenvectors.

Week 14: Summary.

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

Conditions of the teacher's signature (indicating the fulfilment of the mid-term requirements of the course): Altogether at least 50% score on the two mid-term tests (week 6 and week 12). If the student fails to accomplish these requirements, she/he is allowed to write a full-term test on the last week (week 14) of the study period.

Students having signature are to take a written exam during the exam period. Every week during the semester there are short quizzes during the lessons. The points gained in the quizzes are part of the exam scores.

Grading scale applied on the exam:

0% - 49%: fail (1)

50% - 61%: pass (2)

62% -73%: satisfactory/fair (3)

74% - 85%: good (4)

86% - 100%: very good/excellent (5)

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL

<https://openstax.org/details/books/calculus-volume-2>

<https://openstax.org/details/books/calculus-volume-3>

<https://openstax.org/details/books/algebra-and-trigonometry-2e>