



Short Program of Course:

Academic Year: 2021 – 2022

MATHEMATICAL ANALYSIS

"Bachelor" in "Agribusiness Management"
First Cycle Study Program (180 ECTS)

Type of activity	hours
Lectures:	30
Seminars:	
Exercises:	30
Laboratory:	
Fieldwork practice:	
Clinical practice:	
Sportive practice:	

Credits:	5
Discipline:	A

Total workload	5	x	25	=	125
Class workload:					60
Individual workload:					65

Code:	AGR-A-01A
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Description of Course

- 1 MATRICES. Definition of matrix. Addition, multiplication by scalar and multiplication of two matrices. Properties of matrices.
- 2 THE DETERMINANT. Definition of the determinant of a matrix. Calculation and properties of a determinant. Inverse matrix and how to finding it.
- 3 SYSTEMS OF LINEAR EQUATIONS. Definition of the system of linear equations, and of its solution. Kramer method. Equivalent systems. Equivalent transformations. The Gaussian and Gaussian-Jordan methods.
- 4 NUMERICAL SEQUENCES AND THEIR LIMIT. Numeric sequences, definition, operations with them. Monotone and bounded sequences, and sub-sequences. Limit of a numeric sequence, limit theorems.
- 5 FUNCTION. LIMIT OF FUNCTION. Definition of the function and its domain. Operations with functions, their graph and function classes. Limit of function. Limit laws.
- 6 CONTINUITY. One-sided limits, their relation to the limit. Undefined forms. Continuous function. Theorem. Properties of continuous functions in a segment.

7	DERIVATIVES AND DIFFERENTIATION. Definition of the derivative. Derivation rules, table of derivatives. Derivative applications: monotony, convexity and concavity The differential, table of differentials, approximate calculations.
8	INDEFINITE INTEGRAL. Definition of primitive, its properties. Indefinite integral, its properties, table of integrals. Methods of integration by parts and substitution.
9	DEFINITE INTEGRAL. The concept of definite integral. The Fundamental Theorem of Integration. Methods of integration of the definite integral. Applications of the definite integral.
10	PROBABILITY SPACE. Elements of combinatorics. Introduction to probability.
11	PROBABILITY. Classical and statistical definition of probability. Properties of probability.
12	CONDITIONAL PROBABILITY. The definition of conditional probability. Independent events. Total probability and Bayes' formula.
13	RANDOM VARIABLES. Definition of random variables. The distribution function.
14	NUMERICAL CHARACTERISTICS OF RANDOM VARIABLES. The expected value and its properties. Variance and its properties.
15	SOME IMPORTANT DISTRIBUTIONS. Normal distribution and its density. Standard normal distribution. Chi-square Distribution, Student's Distribution, Fisher's Distribution.