LINEAR ALGEBRA AND ANALYTIC GEOMETRY

(course title)

COURSE SYLLABUS ABSTRACT

6-05-0612-03 Information management systems
(speciality code and name)
Automated information processing systems
(concentration)

	STUDY MODE	
	full-time	part-time
Year	1	1
Semester	1	1
Lectures, hours	34	6
Practical classes (seminars), hours	34	6
Exam, semester	1	1
Contact hours	68	12
Independent study, hours	76	132
Total course duration in hours / credit units	144/4	

1. Course outline

Matrices and operations on them; elementary transformations of matrices; determinants of order n, their properties and calculation; inverse matrix; Cramer systems of algebraic equations; vectors, linear operations on vectors; coordinate systems; vector algebra; a straight line on a plane; plane and line in space; curves of the second order on the plane; surfaces of the second order; matrix rank; theory of systems of linear algebraic equations; linear spaces; linear operators; eigenvalues and eigenvectors; linear operators in Euclidean space; quadratic forms.

2. Course learning outcomes

Upon completion of the course, students will be expected to
know: basic methods of analytical geometry, linear algebra; ways of describing straight lines and planes; definitions of curves of the second order on the Euclidean plane and surfaces of the second order in the Euclidean space; criteria for linear dependence of vectors; matrix notation of systems of linear equations; methods for solving systems of linear equations;
be able to: perform algebraic calculations with vectors in three-dimensional Euclidean space; build lines on a plane according to a given equation; work with the simplest coordinate systems (Cartesian, polar, cylindrical and spherical); perform basic algebraic operations on matrices; calculate the determinant of square matrices using expansion in row (column), as well as using the method of equivalent transformations; solve systems of linear equations by the Gauss method, systems of inhomogeneous equations by the Cramer method and the matrix method; find eigenvalues and eigenvectors of the simplest matrices;
to possess a skill: application of methods of analytical and numerical solution of algebraic equations; creative analytical thinking.

3. Competencies

BPC-1. Apply methods of matrix calculus, analyze solutions to systems of linear algebraic equations, investigate equations of curves and surfaces by analytical methods to solve applied engineering problems.

4. Requirements and forms of midcourse evaluation and summative assessment

Intermediate attestation - two computer tests, exam. Each of the computer tests is estimated from 0 to 30 points. The minimum credit score for each test is 18. The exam is scored from 0 to 40 points. The minimum score for passing the exam is 15. The final grade is determined in accordance with the table.

Mark	10	9	8	7	6	5	4	3	2	1	0
Points	100-94	93-87	86-80	79-72	71-65	64-58	57-51	50-41	40-17	16-1	0