LINEAR ALGEBRA AND ANALYTICAL GEOMETRY

COURSE SYLLABUS ABSTRACT OF HIGHER EDUCATION INSTITUTION

Specialty 1-53 01 02 Automated information processing systems

	Study mode	
	Full-time	Part-time
Year	1	1
Semester	1	1
Lectures, hours	34	10
Practical (seminar) classes, hours	34	6
Exam, semester	1	1
Contact hours	68	16
Independent study, hours	52	104
Total course duration in hours / credit units	120/ 3	

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.
As a result of learning the academic discipline, the student must:
– **know**: basic methods of analytical geometry and 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;
– **possess**: methods of analytical and numerical solution of algebraic equations; creative analytical thinking skills.

3. Competencies.
UK-12 Possess the skills of creative analytical thinking.
BOD-1 Apply methods of matrix calculus, analyze solutions to systems of linear algebraic equations, investigate equations of curves and surfaces using analytical methods to solve applied engineering problems.

4. Requirements and forms of midcourse evaluation and summative assessment.
Intermediate attestation - two computer tests, current attestation - 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.

Score	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