

Syllabus of the educational discipline
«LINEAR ALGEBRA AND ANALYTICAL GEOMETRY»

Cycle of Higher Education	<i>First cycle of higher education (Bachelor's degree)</i>
Field of Study	<i>F Information Technologies</i>
Specialty	<i>F7 Computer engineering</i>
Educational program	<i>Computer systems and networks</i>
Discipline status	<i>Normative</i>
Teaching language	<i>English</i>
Year of studies, semester	<i>1 year (1 semester)</i>
Number of credits ECTS	<i>4 credits</i>
Distribution by types of trainings and hours of study	<i>Lectures, Practical studies, Laboratory studies, Independent training</i>
Form of final assessment	<i>Exam</i>
Teacher	<i>Syniavska Olga Olexandrivna, associate professor of department of probability theory and mathematical analysis, PhD</i>
Teacher's contacts	<i>olga.synyavska@uzhnu.edu.ua</i>
Course Schedule	<i>According to the timetable</i>
<p>The purpose of studying the discipline is the formation of student's basic knowledge of the basics of linear algebra, vector algebra, operator algebra, analytical geometry on the plane and in space; ability to solve various problems, apply the acquired knowledge to solve applied problems. Show to students the methods for solving systems of algebraic equations, using vectors to solve engineering problems, methods of construction and analysis for curves and surfaces.</p> <p>As a result of mastering the discipline "Linear Algebra and Analytical Geometry" students must demonstrate the following learning outcomes:</p> <p><i>knowledge:</i></p> <ul style="list-style-type: none"> - methods of solving systems of linear equations, calculation of determinants; - ways to solve geometry problems by methods of vector algebra; - algorithms for orthogonal transformation of quadratic forms, reduction of curves and second order surfaces to the canonical form; - principles of matrix calculus; <p><i>skills:</i></p> <ul style="list-style-type: none"> - analyze the condition of the problem, choose the most effective of the methods of solution; - evaluate the obtained results of solving the problem; - generalize the acquired knowledge into n-dimensional spaces. 	
<p>Prerequisites for learning High School Mathematics Course</p>	
<p>Content of the educational discipline</p>	
<p>Module 1 Content module 1. Linear algebra. Topic 1. Elements of theory of determinants. Topic 2. Matrices and matrix operations. Topic 3. Systems of linear algebraic equations. Topic 4. Linear spaces and linear operators. Calculation work Content module 2. Vector algebra. Topic 5. Vectors and linear operations with them. Topic 6. Scalar, vector and mixed product of vectors. Calculation work Modular control work</p>	
<p>Module 2 Content module 3. Analytical geometry</p>	

<p>Topic 7. Straight line in a Cartesian plane. Topic 8. Line and plane in space. Calculation work Topic 9. Converting coordinates. Topic 10. Second order curves. Topic 11. Surfaces of the second order. Calculation work Modular control work Examination</p>			
<p>Material and technical support (software) of the discipline <i>Mathcad (Geogebra, Desmos)</i></p>			
<p>Course page on the Moodle platform (personal training system)</p>		<p><i>Syllabus of the educational discipline, hyperlinks to electronic publications of the discipline, recommended literature, students' attendance, lecture materials, presentations, questions for self-control, methodical materials for laboratory works, tests, task for checking students' knowledge.</i> https://moodle.uzhnu.edu.ua</p>	
<p>Recommended literature</p>			
<p>1. <i>Higher mathematics [Text]: manual. Kyiv: National aviation univ. "NAU-druk" publ., 2009. Pt. 2 / V. P. Denisiuk, V. G. Demydko, V. K. Repeta. 2009. 243 p.: fig. (Education in English).</i></p> <p>2. <i>Havdzynskiyi V.N., Korobova L.N. Textbook on Sections: Linear Algebra, Vector Algebra&Analytic Geometry. For Students Studying a Course of Higher Mathematics in English. Odessa: ODESSA NATIONAL A.S. POPOV ACADEMY OF TELECOMMUNICATIONS. 2009. 68 p. http://www.dut.edu.ua/uploads/l_351_80718890.pdf</i></p> <p>3. <i>Havdzynskiyi V.N., Korobova L.N. Reference Book on Higher Mathematics. Part I. For students doing a course of higher mathematics in englis. Odessa: ODESSA NATIONAL A.S. POPOV ACADEMY OF TELECOMMUNICATIONS. 2010. 64 p. http://www.dut.edu.ua/uploads/l_352_44088621.pdf</i></p> <p>4. <i>Glushkov A.V., Khetselius O.Yu., Buyadzhi V.V., Higher Mathematics, Part 1. Study guide. Odessa: TEC. 2017. 325p.</i></p>			
<p>Assessment system of learning outcomes</p>			
<p><i>Current control carried out the semester and evaluated by the amount of points (max is 100 points). A minimum amount, that allows a student to get credit is 35 (max is 100 points). Modular control work is divided into two control works; maximum number of points for each test: 50 points (dilution of tasks is specified in the test). During the semester, students perform 4 computational works. Maximum number of points for each calculated work: 25 points. Final (semester) control is carried out in the form of exam and evaluated in points (max is 100 points, min is 35 points).</i></p>			
<p>ECTS and national grading scale</p>			
Mark scale	ECTS	Exam	Test
90 - 100	A	Excellent	Satisfied
82 - 89	B	Good	
74 - 81	C		
64 - 73	D	Satisfactory	
60 - 63	E		
35 - 59	FX	“Unsatisfactory” with possibility to pass the exam again	“Not satisfied” with possibility to pass the exam again
1 - 34	F	“Unsatisfactory” with obligatory repeated study of the discipline	“Not satisfied” with obligatory repeated study of the discipline