SPECIAL MATHEMATICAL METHODS AND FUNCTIONS
(course title)

COURSE SYLLABUS ABSTRACT

1-40 05 01 Information Systems and Technologies (majors in)
(speciality code and name)

1-40 05 01 Information Systems and Technologies (in Designing and Producing)
(specialisation code and name)

	STUDY MODE		
	full-time	part-time	part-time (shortened program)
Year	2	2	1
Semester	3	4	2
Lectures, hours	34	6	8
Practical classes (seminars), hours	16	4	4
Laboratory classes, hours	16	4	4
In-class test (semester, hours)	–	4 (2 часа)	2 (2 часа)
Exam, semester	3	4	2
Contact hours	66	16	18
Independent study, hours	54	104	102
Total course duration in hours / credit units	120 / 3		

1. Course outline: linear space, its basis and dimensionality; elements of functional analysis; application of generalized Fourier series when solving problems; linear mappings, functionals, operators; solving problems in mathematical physics; gamma and beta functions; differential equations and Bessel functions, their applications; application of Laplace transform and Z-transform when solving problems; elements of variational calculus; solving problems by operational calculus.

2. Course learning outcomes

Upon completion of the course, students will be expected to

- know: basic special mathematical functions; the Fourier transform and its properties; the Z-transform, its properties and applications; the Euler equation for the simplest problem of calculus of variations; the Fourier method for linear equations of mathematical physics; systems of linear difference equations with constant coefficients;
- be able to: solve mathematical problems using the operator method, perform integral and discrete transformations; work with special functions, formulate and solve problems in the language of matrices;
- possess: methods of the theory of functions of a complex variable and operational calculus, methods of solution of mathematical physics equations and extreme problems, methods of functional analysis.

3. Competencies. UC-12: Have creative analytical thinking skills. SPC-4: Apply methods of calculus of variations, solve mathematical physics equations, perform integral and discrete transformations.

4. Requirements and forms of midcourse evaluation and summative assessment. Midcourse evaluation: ZIZ - protection of individual assignments; ZLR - protection of laboratory work; ICS - intermediate control of progress. Summative assessment: exam. Assessment of the level of student knowledge and competence at all forms of control is made on a ten-point scale.