



Subject card

Subject name and code		Mathematics, PG_00046325						
Field of study		Informatics, Automatic Control, Cybernetics and Robotics						
Date of commencement of studies		October 2026	Academic year of realisation of subject			2026/2027		
Education level		second-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study		Full-time studies	Mode of delivery			at the university		
Year of study		1	Language of instruction			English		
Semester of study		1	ECTS credits			6.0		
Learning profile		general academic profile	Assessment form			exam		
Conducting unit		Mathematics Center -> Vice-Rector For Education						
Name and surname of lecturer (lecturers)		Subject supervisor		dr Magdalena Musielak				
		Teachers		dr Magdalena Musielak				
Lesson types		Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
		Number of study hours	30.0	30.0	0.0	0.0	0.0	60
		E-learning hours included: 0.0						
Learning activity and number of study hours		Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study	SUM	
		Number of study hours	60	20.0		70.0	150	
Subject objectives		Students obtain competence in using methods of mathematical analysis (calculus) necessary to begin their graduate studies.						
Learning outcomes		Course outcome	Subject outcome			Method of verification		
		[K7_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study by: - appropriate selection of source information and its critical analysis, synthesis, creative interpretation and presentation, - application of appropriate methods and tools	Student recognizes the importance of skillful use of basic mathematical apparatus in terms of study in the future. Student uses the basic methods of mathematical analysis to formulate and solve engineering problems.			[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
		[K7_W01] knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study	Student defines the basic concepts of differential and integral calculus of one variable and multivariable function. Student applies the basic rules to calculate ordinary and partial derivatives. Student applies basic techniques to evaluate single, double and triple integrals. Student uses definite integral to solve geometrical problems. Student uses the differential calculus to analyze properties of one variable and multivariable functions. Student gives the definitions of basic notions of probability theory, elements of field theory, line and surface integrals, number and function series, and the Fourier series. Student demonstrates different methods of solving ordinary differential equations, also using Laplace transform.			[SW1] Assessment of factual knowledge		

Subject contents	Course content – lecture <ul style="list-style-type: none"> <li>• Differential and integral calculus of function of one variable.</li> <li>• Ordinary differential equations.</li> <li>• Differential and integral calculus of function of several variable.</li> <li>• Elements of field theor.</li> <li>• Number sequences and series.</li> <li>• Power series. The Fourier series.</li> <li>• Elements of probability theory.</li> </ul>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Tests	50.0%	50.0%
	Final exam	50.0%	50.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Sherman K. Stein, Calculus and analytic geometry, McGraw-Hill Book Company, 4th edition, 1987,</li> <li>2. George B. Thomas, Jr., Ross L. Finney, Calculus and Analytic Geometry, Addison-Wesley Publishing Company, 7th edition, 1988</li> <li>3. John E. Hanke, Arthur G. Reitsch, "Understanding Business Statistics", IRWIN, 1991</li> <li>4. M. Bednarczyk, A. Dąbrowicz - Tłałka, "Elementy rachunku prawdopodobieństwa w zadaniach", Wydawnictwo PG, 2012</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>1. K.T. Jankowscy, Zbiór zadań z matematyki, cz. 1, PG Gdańsk</li> <li>2. K.T. Jankowscy, "Funkcje wielu zmiennych. Całki wielokrotne. Geometria analityczna", Wydawnictwo PG, 2005</li> <li>3. K.T. Jankowscy "Zadania z matematyki wyższej", Wydawnictwo PG, 2001</li> </ol>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Find the general solution of the differential equation.....</li> <li>2. Find the local extreme values of the function <math>f(x,y)</math>.</li> <li>3. Find the volume of a solid bounded by the surfaces.</li> <li>4. Determine convergence of the series.</li> </ol>		
Practical activities within the subject	Not applicable		

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