GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mathematics III, PG_00059248		
Field of study	Matematyka III		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	first-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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
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 inż. Renata Zakrzewska	
	Teachers	mgr Katarzyna Kiepiela dr inż. Renata Zakrzewska mgr Małgorzata Kula mgr Danuta Beger	

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						
	eNauczanie source addresses: Moodle ID: 46676 WILiŚ - Bud. sem 3 - Matematyka 2025/2026 (R.Zakrzewska) https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46676						

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	5.0	60.0	125

Subject objectives	
	Students obtain competence in the range of using methods of mathematical analysis and linear algebra and knowledge how to solve simple problems that can be found in the field of engineering.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U01] Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering to solve engineering problems and issues.	Student compute multiple integrals and use them in geometry and mechanics. Student gives definition of notions from field theory. Student studies canvergence of number series. Student uses power series in order to compute sums of number series. Student calculates the probability of random events. Student describes the basic types of distributions of random variables.Student compute multiple integrals and use them in geometry and mechanics. Student gives definition of notions from field theory. Student studies canvergence of number series. Student uses power series in order to compute sums of number series. Student calculates the probability of random events. Student describes the basic types of distributions of random variables.	[SU1] Ocena realizacji zadania
[K6_W01] Demonstrate knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering at a level necessary to achieve the other programme outcomes.	Student compute multiple integrals and use them in geometry and mechanics. Student gives definition of notions from field theory. Student studies canvergence of number series. Student uses power series in order to compute sums of number series. Student calculates the probability of random events. Student describes the basic types of distributions of random variables.	[SW1] Ocena wiedzy faktograficznej

Subject contents

Double and triple integrals. Applications of multiple integrals. Elements of field theory: Scalar and vector

fields, the gradient of a scalar field,

divergence and rotation of a vector field, a potential field. Line integrals with applications.

Number series and function series: Number series. Convergent and

divergent series. Convergence tests of the number series. Power series. Radius and interval of

convergence. Calculus of probability: Discrete and continuous random

variables, distribution function, expected value and variance of a random variable. Basic distribution of

random variables.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
midterm colloquium	50.0%	60.0%
written exam	50.0%	40.0%

Recommended reading	Basic literature	J. Dymkowska, D. Beger, Rachunek całkowy w zadaniach, PG, Gdańsk 2015 K. Jankowska, T. Jankowski, Zadania z matematyki wyższej, PG, Gdańsk 1999 K. Jankowska, T. Jankowski, Funkcje wielu zmiennych, całki wielokrotne, geometria analityczna, PG, Gdańsk 2005. W. Krysicki, Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach I, Wydawnictwo Naukowe PWN, Warszawa 2005 A Plucińska, E. Pluciński, Elementy probabilistyki, Wydawnictwo Naukowe PWN, Warszawa 1981 W. Stankiewicz, Zadania z matematyki dla wyższych uczelni technicznych, Wydawnictwo Naukowe PWN, Warszawa 1995
	Supplementary literature	M. Gewert, Z. Skoczylas, Elementy analizy wektorowej, Oficyna Wydawnicza GiS, Wrocław 2003 R. Leitner, J. Zacharski, Zarys matematyki wyższej II, Wydawnictwa Naukowo-Techniczne, Warszawa 2005. R. Leitner, J. Zacharski, Zarys matematyki wyższej III, Wydawnictwa Naukowo-Techniczne, Warszawa 2005. R. Leitner, W. Matuszewski, Z. Rojek, Zadania z matematyki wyższej II, Wydawnictwa Naukowo-Techniczne, Warszawa 1999. W. Krysicki, L. Włodarski Analiza matematyczna w zadaniach II, Wydawnictwo Naukowe PWN, Warszawa 1998. B. Gdowski, Elementy geometrii różniczkowej w zadaniach, Wydawnictwo Naukowe PWN, Warszawa 1982 . W. Żakowski, M. Kołodziej, Matematyka - część III, Wydawnictwa Naukowo-Techniczne, Warszawa 1963.
	eResources addresses	

Example issues/ example questions/ tasks being completed	1. Find a potential field for F(x,y,z)=[2x+yz,2y+xz,2z+xy]. 2. Calculate line integral Lx dl, L:y=x, 0x1 3. Check whether the given series is convergent with general term an=1/n tg(1/n3), bn=n!/nn , cn=1/n ln n, using the ratio test, the root test. the comparison test or the integral test. 4. Give the probability distribution and cumulative distribution function for the given discrete random variable X: x1=-1, p1=0,4, x2=2, p2=0,6. 5. Compute the expectation and variation of the given continuous random variable f(x)=2x dla 0x2 i f(x)=0 dla x<0, x>2. 6. Find the area between the two curves y2=4+x and x+3y=0. 7. Using cylindrical or spherical coordinates evaluate the triple integral of the given function f(x,y,z)=x2+y2+z2 over the region V: x2+y2+z2=4, 3z2= x2+y2.
Practical activites within the subject	Not applicable

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