

## GDAŃSK UNIVERSITY

## Subject card

Subject name and code	Introduction to the measure theory, PG_00021502							
Field of study	Mathematics							
Date of commencement of	October 2021 Academic year of 2022/2023							
studies			realisation of subject			2022/2023		
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study		
						Subject group related to scientific research 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			4.0		
Learning profile	general academic profile		Assessment form			assessment		
Conducting unit	Department of Nonlir	near Analysis a	nd Statistics ->	Faculty of Ap	plied Ph	ysics a	nd Mathemati	CS
Name and surname	Subject supervisor dr hab. Piotr Bartłomiejczyk							
of lecturer (lecturers)	Teachers		mgr inż. Tomasz Gzella					
			dr hab. Piotr Bartłomiejczyk					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study	15.0	30.0	0.0	0.0	-	0.0	45
	hours							
	E-learning hours incl					0.15		
Learning activity and number of study hours	Learning activity Participation ir classes include plan				Self-study S		SUM	
	Number of study 45 hours		5.0		50.0		100	
Subject objectives	Equip students with s	specialized mat	hematical tools	aided for tech	nical su	bjects.		
Learning outcomes	Course out	tcome	Subject outcome			Method of verification		
	K6_U06					[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
	K6_W02					[SW1] Assessment of factual knowledge		
	K6_U01					[SU2] Assessment of ability to analyse information		
	K6_U04					[SU4] Assessment of ability to use methods and tools		
	К6_U03					[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools		
Subject contents	Measure of elementary sets. Jordan measure and its properties. Darboux integral and its properties. Lebesgue measure and its properties. Vitali set. Completeness of measure. Lebesgue integral and its properties. Lusin's theorem. Egorov's theorem. Families of sets, semi-algebras. Measures and their basic properties. Measures on Borel sets. Measurable functions. Integral with respect to measure. Monotone convergence theorem. Fatou lemma. Dominated convergence theorem.							
Prerequisites and co-requisites	set theory, calculus							
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade		
	Test of lecture		51.0%			50.0%		
	Activity					10.0%		
	Colloquium no 1					20.0%		
	Colloquium no 2		51.0%			20.0%		

Recommended reading	Basic literature	1) T. Tao, Introduction to measure theorem.				
Recommended reading						
	Supplementary literature	1) P. Billingsley, Probability and measure, . PWN 1979.				
		2) V. Bogachev, Measure Theory, vol. I, II. Springer 2007.				
		3) K. Maurin, Analysis, PWN 1973.				
	eResources addresses	Adresy na platformie eNauczanie:				
		Wstęp do teorii miary - ćwiczenia 22/23 - Moodle ID: 25788				
		https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25788				
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		https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25788				
Example issues/	Give the definition of Jordan measure and compute the Jordan measure of an arbitrary triangle.					
example questions/						
tasks being completed	Discuss the construction of integrals with respect to measure.					
Work placement	Not applicable					