GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Introduction to the measure theory, PG_00021502		
Field of study	Mathematics		
Date of commencement of studies	October 2021	Academic year of 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 Nonlinear Analysis and Statistics -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Piotr Bartłomiejczyk	
	Teachers	mgr inż. Tomasz Gzella dr hab. Piotr Bartłomiejczyk	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	30.0	0.0	0.0	0.0	45

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	45	5.0	50.0	100

Subject objectives

Equip students with specialized mathematical tools aided for technical subjects.

Learning outcomes

Course outcome	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
K6_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	51.0%	10.0%
Colloquium no 1	51.0%	20.0%
Colloquium no 2	51.0%	20.0%

Recommended reading	Basic literature	1) T. Tao, Introduction to measure theorem.
	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 Wstęp do teorii miary - ćwiczenia 22/23 - Moodle ID: 25788 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25788
Example issues/ example questions/ tasks being completed	Give the definition of Jordan measure and compute the Jordan measure of an arbitrary triangle. Discuss the construction of integrals with respect to measure. Formulate and prove the monotone convergence theorem.	
Work placement	Not applicable	