



Subject card

Subject name and code	Compensatory object , PG_00021035						
Field of study	Mathematics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
Education level	second-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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Zakład Analizy Nieliniowej -> Instytut Matematyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Chmara				
	Teachers		dr inż. Magdalena Chmara mgr inż. Michał Krzemiński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	30.0	0.0	0.0	0.0	30
	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	30		0.0		0.0	30
Subject objectives	Repetition of selected problems from mathematics needed to study for the second level (for students of mathematics PG) and fill in the gaps for students of other specialties.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_U05		The revision and supplementation of knowledge from the basic mathematics sections necessary for further education at master's studies. Detailed discussion of the issues needed for a given specialization.		[SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment		
	K7_W01		Supplementing knowledge of basic subjects in the scope appropriate for a given specialization.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	K7_U02		A reminder of many important theorems from the basic branches of mathematics, their proofs and practical applications. The ability to apply the acquired theoretical knowledge in practice in accounting and practical tasks.		[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information		

Subject contents	<p>Content tailored to the appropriate degree.</p> <p>Data Analytics: statistics, probability, and their applications for datasets and generated datasets, R, RStudio.</p> <p>Geometry and Computer Graphics: applications of linear algebra and mathematical analysis in geometry, projective space and homogeneous coordinates, quaternions, Python.</p> <p>Financial Mathematics: statistics, probability and their applications, Python.</p>		
Prerequisites and co-requisites	Basic knowledge of mathematical analysis, analytical geometry, linear algebra, measure theory, probability theory.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exercises	50.0%	100.0%
Recommended reading	Basic literature	<p>Analytik danych:  Suess, Eric A., Trumbo, Bruce E - Introduction to Probability Simulation and Gibbs Sampling with R, Springer 2010  J. Jakubowski, R. Sztencel - Wstęp do teorii prawdopodobieństwa 2010</p> <p>Geometria i Grafika Komputerowa:  Marc Peter Deisenroth, A. Aldo Faisal, Cheng Soon Ong - Mathematics for Machine Learning, Cambridge University Press 2020  Geometry for Computer Graphics Formulae, Examples and Proofs, John Vince  A. Romanowski - Algebra liniowa 2003  Duncan Marsh, Applied Geometry for Computer Graphics and CAD, Springer 2005</p> <p>Matematyka Finansowa:  Marc Peter Deisenroth, A. Aldo Faisal, Cheng Soon Ong - Mathematics for Machine Learning, Cambridge University Press 2020  J. Jakubowski, R. Sztencel - Wstęp do teorii prawdopodobieństwa 2010  Suess, Eric A., Trumbo, Bruce E - Introduction to Probability Simulation and Gibbs Sampling with R, Springer 2010</p>	
	Supplementary literature	<p>A. Białynicki-Birula - Algebra liniowa z geometrią  B. Gdowski, E. Pluciński - Zadania z geometrii analitycznej  F. Preparata, M. Shamos - Geometria obliczeniowa. Wprowadzenie  M. Krzyśko - Wykłady z teorii prawdopodobieństwa  G. James, D. Witten, T. Hastie, R. Tibshirani An Introduction to Statistical Learning (2017)  C. Bishop Pattern Recognition and Machine Learning (2006)  T. Hastie, R. Tibshirani, J. Friedman The Elements of Statistical Learning (2017)  M. Evans, J. Rosenthal Probability and Statistics (2009)</p>	
	eResources addresses	<p>Adresy na platformie eNauczanie:  Przedmiot Wyrównawczy (GiGK i MF) 2022/2023 - Moodle ID: 25248  <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=25248">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=25248</a>  Przedmiot Wyrównawczy (GiGK i MF) 2022/2023 - Moodle ID: 25248  <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=25248">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=25248</a></p>	
Example issues/ example questions/ tasks being completed	<p>Calculate conditional expected value for the random variable <math>X(t) = t^2</math> if the probability space is equal to <math>[0, 1]</math>, the sigma body is spanned by dyadic intervals less than <math>1/8</math>, and the probability measure is equal to Lebesgue measure.</p> <p>Find the matrix of the oblique projection on the plane in space in homogeneous coordinates. Make a rotation with quaternions.</p>		
Work placement	Not applicable		