

GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	VOLATILITY MODELING AND MARKET RISK ANALYSIS, PG_00060822								
Field of study	Economic Analytics								
Date of commencement of studies	October 2023		Academic year of realisation of subject			2024/2025			
Education level	second-cycle studies		Subject group		Optional subject group 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			English			
Semester of study	3		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form			exam			
Conducting unit	Katedra Statystyki i E	aculty of Management and Economics							
Name and surname	Subject supervisor		dr hab. Michał Pietrzak						
of lecturer (lecturers)	Teachers dr hab. Michał Pietrzak					_			
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory Project		t	Seminar	SUM	
	Number of study hours	15.0	0.0	30.0	0.0		0.0	45	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation ir classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study hours	45		3.0		27.0		75	
Subject objectives	Analyzes financial and capital markets using in-depth knowledge of model structures and applicable methods								
Learning outcomes	Course outcome Subject outcome Method of verification								
	[K7_U03] formulates research problems and selects appropriate analytical methods for their effective solution, using advanced IT tools, and evaluates the results critically		uses complex models, taking into account factors relevant to the studied phenomena and selecting analytical methods that ensure effective solutions			[SU3] Assessment of ability to use knowledge gained from the subject			
	[K7_W05] takes into account in the analyzes in an in-depth way both the economic, legal and ethical context, being aware of the responsibility for the consequences of its decisions		models financial and capital markets, ensuring the effectiveness of its decisions in the economic and legal context			[SW1] Assessment of factual knowledge			
Subject contents	Financial and capital markets, the problem of modeling both markets, empirical examples Efficiency of the capital market, basic methods of researching information effectiveness The problem of obtaining, sharing and distributing financial data by institutions in the light of market efficiency and institutional requirements Information effectiveness research methods Efficiency of the capital market, basic methods of researching information effectiveness The problem of financial data visualization Empirical properties of financial data, identification and testing Modeling the rate of return and the level of risk for individual financial instruments using models from the ARMA-GARCH family The task of modeling long memory and persistence in capital markets VaR modeling and the concept of implied volatility Modeling the rates of return, the level of risk and the level of interdependence for a portfolio of financial instruments using multidimensional GARCH models The problem of investment portfolio management, one-dimensional and multidimensional approaches VaR for the investment portfolio								
Prerequisites and co-requisites									
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade				
	Exam		60.0%		70.0%				
	Test		60.0%		30.0%				

Recommended reading	Basic literature	Jajuga K., Jajuga T. Inwestycje, PWN, 2011 Tarczyński W. Rynki kapitałowe Vol I. Metody ilościowe, Placet, 2001 Tarczyński W. Rynki kapitałowe Vol. II. Metody ilościowe, Placet, 2001 David G. Luenberger Teoria inwestycji finansowych Wydaw. Naukowe PWN, 2003 David Ruppert, David S. Matteson Statistics and Data Analysis for Financial Engineering Springer, 2015				
	Supplementary literature	Zvi Bodie, Alex Kane, Alan J. Marcus Investments McGraw-Hill Education, 2021 Piotr Fiszeder Modele klasy GARCH w empirycznych badaniach finansowych Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, 2009 Oliver Linton Financial Econometrics: models and methods Cambridge University Press, 2019				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed						
Work placement	Not applicable					