



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 2024	Academic year of realisation of subject			2025/2026		
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			Polish		
Semester of study	3	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor						
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	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 in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	45		4.0		26.0	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 hypotheses and selects appropriate analytical methods for their verification, utilizing advanced IT tools, and critically evaluates the obtained results.		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] Possesses in-depth knowledge of the principles of integrating economic, legal, and ethical contexts in analyses and applying them in entrepreneurial activities while respecting copyright protection rules		models financial and capital markets, ensuring the effectiveness of its decisions in the economic and legal context		[SW1] Assessment of factual knowledge		
Subject contents	<ul style="list-style-type: none"> • Characteristics of financial and capital markets, the problem of modeling markets, market efficiency, empirical examples • Acquisition and sharing of financial data in light of market efficiency • Visualization of financial data • Empirical properties of financial data • Modeling of rates of return and their correlations • Risk in equity investments - measurement and modeling, Value at Risk (VaR) • Models for price changes, option pricing, implied volatility • One-dimensional and multidimensional ARIMA-GARCH models • Long memory and persistence in financial markets • Investment portfolio analysis, multivariate VaR modeling for investment portfolios • Log-optimal strategy 						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Tests and assignments		60.0%		50.0%		
	Exam		60.0%		50.0%		
Recommended reading	Basic literature		David G. Luenberger, Investment Science 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 Oliver Linton, Financial Econometrics: models and methods, Cambridge University Press, 2019
	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.