


**KAPITAŁ LUDZKI**  
NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
Unię Europejską w ramach  
Europejskiego Funduszu  
Społecznego

**UNIA EUROPEJSKA**  
EUROPEJSKI  
FUNDUSZ SPOŁECZNY


Nazwa przedmiotu			Kod ECTS
Quantitative Methods for Finance			14.3.7095
Nazwa jednostki prowadzącej przedmiot			
Katedra Ekonometrii			
Studia			
wydział	kierunek	poziom	drugiego stopnia
Wydział Zarządzania	Finanse i rachunkowość	forma	stacjonarne
		moduł	Finance and Accounting
		specjalnościowy	
		specjalizacja	wszystkie
Nazwisko osoby prowadzącej (osób prowadzących)			
prof. UG, dr hab. Anna Zamojska; dr Sabina Nowak			
Formy zajęć, sposób ich realizacji i przypisana im liczba godzin			Liczba punktów ECTS
Formy zajęć			8
Wykład, Ćw. audytoryjne			1 ECTS (30h) participation in lectures
Sposób realizacji zajęć			1 ECTS (30h) participation in tutorials
zajęcia w sali dydaktycznej			2 ECTS (60h) self-study, literature review and preparation for the classes
Liczba godzin			2 ECTS (60h) data collection, assimilating software manuals
Wykład: 30 godz., Ćw. audytoryjne: 30 godz.			2 ECTS (60h) preparation of a project
Termin realizacji przedmiotu			
2023/2024 zimowy			
Status przedmiotu		Język wykładowy	
obowiązkowy		angielski	
Metody dydaktyczne		Forma i sposób zaliczenia oraz podstawowe kryteria oceny lub wymagania egzaminacyjne	
<ul style="list-style-type: none"><li>- Metoda projektów (projekt badawczy, wdrożeniowy, praktyczny)</li><li>- Wykład z prezentacją multimedialną</li></ul>		Sposób zaliczenia	
		<ul style="list-style-type: none"><li>- Zaliczenie na ocenę</li><li>- Egzamin</li></ul>	
		Formy zaliczenia	
		<ul style="list-style-type: none"><li>- wykonanie pracy zaliczeniowej - projekt lub prezentacja</li><li>- egzamin pisemny testowy</li></ul>	
		Podstawowe kryteria oceny	
		Tutorials: 45% group project, 45% written test, 10% classroom activities.	
		Lectures: assessment based on the written exam.	
		The final grades are based on the score according the University terms of study:	
		50% or less -2,0 (fail)	
		>50% - 3.0 (pass)	
		>60% - 3.5 (pass +)	
		>70% - 4.0 (good)	
		>80% - 4.5 (good+)	
		>90% - 5.0 (very good)	
Sposób weryfikacji założonych efektów uczenia się			

Learning outcomes	Exam	Project	Classroom activities
Knowledge			
W05	x	x	x
W09	x	x	
Skills			
U03		x	x
U04		x	x
U09	x	x	x
Social competences			
K02		x	x
K03		x	x
K06	x	x	x

### Określenie przedmiotów wprowadzających wraz z wymogami wstępnymi

#### A. Wymagania formalne

n.a.

#### B. Wymagania wstępne

Descriptive statistics, inferential statistics and introduction to the econometrics

### Cele kształcenia

The aim of the course is to provide students with an understanding and basic skills to use quantitative methods for finance and investment. Students develop the ability to formulate problems into quantitative models, to aid the successful resolution of the problem. Students learn how to apply statistical methods to analyse past data and infer future trends. Using output from mathematical and statistical models, students learn to analyse, interpret and conclude from quantitative information.

### Treści programowe

1. Statistical Concepts and Market Returns. Modelling return distributions: descriptive analysis of returns series, empirical evidence on tail indices, testing for covariance stationarity, modelling the central part of returns distributions.
2. Correlation and Regression, Assumptions of the Linear Regression Model, Analysis of Variance in a Regression, Prediction Intervals, Limitations of Regression Analysis.
3. Multiple Regression and Issues in Regression Analysis, Using Dummy Variables in Regressions, Heteroskedasticity, Serial Correlation, Multicollinearity, Misspecified Functional Form, Models with Qualitative Dependent Variables.
4. Time-Series Analysis, Autoregressive (AR) Time-Series Models, Random Walks and Unit Roots, Moving-Average Time-Series Models, Autoregressive Moving-Average Models, Autoregressive Conditional Heteroskedasticity Models.
5. Multifactor Models and Modern Portfolio Theory, Multifactor Models, Factors and Types of Multifactor Models, Factor Models in Return Attribution, Factor Models in Risk Attribution, Factor Models in Portfolio Construction.

### Wykaz literatury

#### A. Literatura podstawowa

Maggin J.L., Tuttle D.L., McLeavey D.W., and Pinto J.E., Managing Investment Portfolio. A Dynamic Process, John Wiley & Sons, 2007.

DeFusco R., et al., Quantitative Investment Analysis, John Wiley & Sons, 2015.

#### B. Literatura uzupełniająca

Brooks C., Introductory Econometrics for Finance, Cambridge University Press, 2008.

Carol A., Market Risk Analysis: Quantitative Methods in Finance, John Wiley & Sons, 2008.

### Kierunkowe efekty uczenia się

Student knows:

W05- advanced methods and tools, including data acquisition and analysis techniques, appropriate for economic sciences, allowing to describe economic structures and institutions as well as processes within and between them

W09- grammar structures and vocabulary in the area of finance and accounting in English

Student can:

U03- analyze the causes and effects of specific processes

### Wiedza

Student knows:

- various stylized facts of the financial time series
- how to formulate and estimate the model
- the features of the different frequency time series
- different dynamic models
- different methods of model estimation
- how to model the volatility of the rate of return
- how to estimate the multivariate model
- how to forecasting and make a forecast evaluation

### Umiejętności

and phenomena in the field of finance properly, using advanced theories and complex methods of economic sciences, identify the stakeholders of financial processes and phenomena

U04- forecasts economic processes and phenomena in the field of finance and accounting using advanced methods and tools

U09- speak English at the B2 level (European Language Description System) and is able to prepare written papers and oral presentations in English,

Student demonstrates the following social competences:

K02- Cooperation (cooperates in a team and undertakes various team roles, has elementary organizational skills which allow to accomplish goals connected with planning and undertaking professional activities)

K03- Communication (communicates in a way understandable to others, expresses own opinions and constructive criticism, is not afraid to ask questions; participates and moderates discussion)

K06- Creativity (creative thoughts, can think and act in an entrepreneurial way, can adapt to the requirements of the environment flexibly)

Student can:

- formulate problems into quantitative models
- demonstrate competency in numeric skills
- apply statistical methods to analyse past data and infer future trends
- analyse and interpret output from estimated models
- demonstrate an understanding of appropriate application of quantitative techniques to a range of problems in the finance
- communicate the results of quantitative analyses in the contexts of finance
- recognise limitations of the quantitative models

#### Kompetencje społeczne (postawy)

Student :

- acts as a team player or team leader to complete classroom activities or course project
- prepares and gives presentations
- moderates and participates in discussions, expresses own opinions and constructive criticism about projects of peer students
- experiments and looks for alternative approaches in corporate valuation

#### Kontakt

anna.zamojska@ug.edu.pl