Syllabus

1. Programme information

1.1. Institution	THE BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
1.2. Faculty	Finance and Banking
1.3. Departments	Department of Finance, Department of Money and Banking
1.4. Field of study	Finance
1.5. Cycle of studies	Master Studies
1.6. Education type	Full-time
1.7. Study programme	Master of Applied Finance
1.8. Language of study	English
1.9. Academic year	2024-2025

2. Information on the discipline

2.1. Name	**Quantitative methods in finance**								
2.2. Code	**24.0276IF1.1-0003**								
2.3. Year of study	**1**	2.4. Semester	**1**	2.5. Type of assessment	**Exam**	2.6. Status of the discipline	**O**	2.7. Number of ECTS credits	**8**

2.8. Leaders	C(C)	**Cadru asoc Prof.dr. FARKAS ERICH WALTER**	
	C(C)	**prof.univ.dr. NECULA Ciprian**	ciprian.necula@fin.ase.ro
	S(S)	**Cadru asoc Prof.dr. FARKAS ERICH WALTER**	
	S(S)	**prof.univ.dr. NECULA Ciprian**	ciprian.necula@fin.ase.ro

3. Estimated Total Time

3.1. Number of weeks	14.00		
3.2. Number of hours per week	3.00	of which	
		S(S)	2.00
		C(C)	1.00
3.3. Total hours from curriculum	42.00	of which	
		S(S)	28.00
		C(C)	14.00
3.4. Total hours of study per semester (ECTS*25)	200.00		
3.5. Total hours of individual study	158.00		
Distribution of time for individual study			
Study by the textbook, lecture notes, bibliography and student's own notes	80.00		
Additional documentation in the library, on specialized online platforms and in the field	30.00		
Preparation of seminars, labs, assignments, portfolios and essays	45.00		
Tutorials	0.00		
Examinations	3.00		
Other activities	0.00		

4. Prerequisites

4.1. of curriculum	
4.2. of competences	

5. Conditions

for the S(S)	Tutorials are held in rooms with internet access and multimedia teaching equipment.
for the C(C)	Lectures are held in rooms with internet access and multimedia teaching equipment.

6. Acquired specific competences

PREFESSIONAL	C1	Operating ability with mathematical, financial, statistical and econometric functions
PREFESSIONAL	C2	Sourcing, compilation, processing, analysis and synthesis of financial information
PREFESSIONAL	C3	Evaluation and quantification of financial risk management
PREFESSIONAL	C4	Analysis, profiling and modeling of the behavior of investors on the financial markets

7. Objectives of the discipline

7.1. General objective	Developing and applying methods, techniques and instruments of quantitative analysis in the context of portfolio management and for predicting the evolution of economic and financial phenomena
7.2. Specific objectives	- Investigating the stylized facts of asset returns in order to select the most suitable quantitative models; - The use of quantitative methods for modeling the returns and the volatility of financial assets and of financial assets portfolios; - Measuring market risk in order to improve investment decisions on financial markets.

8. Contents

8.1. C(C)		Teaching/Work methods	Recommendations for students
1	Quantitative Risk Management - Fundamentals of Quant. Risk management - Risk measures: Value at Risk, Expected Shortfall	Class debates, applications and case study analysis 2 lectures	
2	Numerical methods for financial instruments - Bonds fundamentals - Equities (Risk and Return of an Equity Portfolio, Portfolio Optimization, Measuring the Risk of an Equity Portfolio) - Derivatives: Forwards. Options.	Class debates, applications and case study analysis 2 lectures	
3	Fundamentals - Basic Time Series Concepts. AR, MA and ARMA processes; Stationarity and unit-root, Seasonality; Box-Jenkins methodology; Forecasting time series. Probability distributions. - The linear regression model: introduction, estimation, interval estimation and hypothesis testing - Extensions of linear regression model. The Multiple Linear Regression Model - Modeling asset return volatility.	Class debates, applications and case study analysis 3 lectures	

Bibliography

- Alexander, C., Market Models: A Guide to Financial Data Analysis, John Wiley & Sons, 2001
- Brooks, C., Introductory Econometrics for Finance, Cambridge University Press, 2008
- Christoffersen, P. F., Elements of Financial Risk Management, Academic Press, 2003
- Enders, W., Applied Econometrics Time Series, John Wiley & Sons, 2004
- Greene, W. H., Econometric Analysis, Prentice Hall, 2012
- Wilmott, P., Paul Wilmott on Quantitative Finance, John Wiley & Sons, 2006

8.2. S(S)		Teaching/Work methods	Recommendations for students
1	Monte Carlo simulation	Interactive seminars with practical applications 1 tutorial	
2	Quantitative modellling in finite discrete markets	Interactive seminars with practical applications 1 tutorial	
3	Quantitative Risk Management	Interactive seminars with practical applications 1 tutorial	
4	Numerical methods for financial instruments	Interactive seminars with practical applications 1 tutorial	
5	Cointegration	Interactive seminars with practical applications 1 tutorial	
6	Vector Autoregressive (VAR) models	Interactive seminars with practical applications 2 tutorials	
7	Modeling asset return volatility	Interactive seminars with practical applications 1 tutorial	
8	Extensions of the linear regression model. The Multiple Linear Regression Model. – applications for economic and financial data	Interactive seminars with practical applications 1 tutorial	
9	The linear regression model: introduction, estimation, interval estimation and hypothesis testing	Interactive seminars with practical applications 2 tutorials	
10	Basic Time Series Concepts. AR, MA and ARMA processes; Stationarity and unit-root, Seasonality; Box-Jenkins methodology; Forecasting time series. Probability distributions.	Interactive seminars with practical applications 2 tutorials	
11	Introductory lecture with focus on: - The objectives of the course and the abilities that will be acquired; - The methods and instruments of learning that will be employed; - Course requirements and the evaluation standards.	Interactive seminars with practical applications 1 tutorial	

Bibliography

- Brooks, C., Introductory Econometrics for Finance, Cambridge University Press, 2008
- Enders, W., Applied Econometrics Time Series, John Wiley & Sons, 2004
- Wilmott, P., Paul Wilmott on Quantitative Finance, John Wiley & Sons, 2006
- Christoffersen, P. F., Elements of Financial Risk Management, Academic Press, 2003
- Alexander, C., Market Models: A Guide to Financial Data Analysis, John Wiley & Sons, 2001
- Greene, W. H., Econometric Analysis, Prentice Hall, 2012

9. Corroboration of the contents of the discipline with the expectations of the representatives of the epistemic community, of the professional associations and representative employers in the field associated with the programme

Regular meetings are taking place with the representatives of the epistemic community, professional organizations and important employers.

10. Assessment

Type of activity	Assessment criteria	Assessment methods	Percentage in the final grade
10.1. S(S)	Homework/project	Homework and/or individual project	30.00
10.2. Final assessment	Exam evaluation	written exam	70.00

10.3. Modality of grading	Whole notes 1-10
10.4. Minimum standard of performance	At least 50% of the total points for this course.

Date of listing,
10/30/2024

Signature of the discipline leaders,

Date of approval in the department

Signature of the Department Director,