

Syllabus

1. Programme information

1.1. Institution	THE BUCHAREST UNIVERSITY OF ECONOMIC STUDIES
1.2. Faculty	
1.3. Departments	Department of Money and Banking
1.4. Field of study	
1.5. Cycle of studies	PhD Studies
1.6. Education type	Full-time
1.7. Study programme	Finance
1.8. Language of study	Romanian
1.9. Academic year	2023-2024

2. Information on the discipline

2.1. Name	Quantitative methods applied in finance and monetary economics								
2.2. Code	23.0180IF1.1-0003								
2.3. Year of study	1	2.4. Semester	1	2.5. Type of assessment	Test	2.6. Status of the discipline	O	2.7. Number of ECTS credits	7
2.8. Leaders	C(C)	prof.univ.dr. NEGREA Bogdan Cristian							
	C(C)	prof.univ.dr. NECULA Ciprian							

3. Estimated Total Time

3.1. Number of weeks	14.00		
3.2. Number of hours per week	2.00	of which	
		C(C)	2.00
3.3. Total hours from curriculum	28.00	of which	
		C(C)	28.00
3.4. Total hours of study per semester (ECTS*25)	175.00		
3.5. Total hours of individual study	147.00		
<i>Distribution of time for individual study</i>			
Study by the textbook, lecture notes, bibliography and student's own notes	112.00		
Additional documentation in the library, on specialized online platforms and in the field			
Preparation of seminars, labs, assignments, portfolios and essays	33.00		
Tutorials			
Examinations	2.00		
Other activities			

4. Prerequisites

4.1. of curriculum	
--------------------	--

4.2. of competences	
---------------------	--

5. Conditions

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

6. Acquired specific competences

-

7. Objectives of the discipline

7.1. General objective	Development of skills for applying state-of-the-art numerical methods for solving models used in the analysis of financial and monetary phenomena
7.2. Specific objectives	<ul style="list-style-type: none"> - Using specific numerical methods for solving continuous time models with heterogeneous agents - Using specific numerical methods for portfolio optimization - Using specific numerical methods for pricing financial derivatives

8. Contents

8.1. C(C)		Teaching/Work methods	Recommendations for students
1	Quantitative methods for solving continuous time models with heterogeneous agents - numerical methods for solving the Hamilton-Jacobi-Bellman equation; - numerical methods for solving models without aggregated shocks: Bewley – Huggett type models, Aiyagari type models; - numerical methods for solving models with aggregated shocks: Krusell – Smith type models; - numerical methods for solving models with frictions: HANK type models;	discourse, debate, applications 7 lectures	
2	Quantitative methods for analyzing financial assets and derivatives - portfolio optimization using the multidimensional generalized hyperbolic distribution; - pricing of European-type options using the inverse Fourier transform methodology; - numerical methods for pricing exotic options;	discourse, debate, applications 7 lectures	
Bibliography - Recent scientific papers			