Course Unit Descriptor

Study Programme: Applied Mathematics	
Course Unit Title: Financial Mathematics 2	
Course Unit Code: MB11	
Name of Lecturer(s): Prof. Natasa Krejic	
Type and Level of Studies: Master Academic Degree	
Course Status (compulsory/elective): Elective	
Semester (winter/summer): Winter	
Language of instruction: English	
Mode of course unit delivery (face-to-face/distance learning): face-to-face	
Number of ECTS Allocated: 7.5	
Prerequisites:	

Course Aims: The objective of this course is to introduce the concept of mathematical models as an important tool in finances. The aim is to provide knowledge for understanding the models of portfolio analysis and the models of pricing financial derivatives, to develop modelling skills in the area of finances.

Learning Outcomes: The student will be able to apply the risk models to real data, to understand the meaning of the results obtained and to perform investment analysis of complex financial instruments.

Syllabus:

Theory: Mean variance portfolio analysis. CAP Model. APT model. Utility Functions. The Arrow-Debreu securities. Financial derivatives. Forwards and futures. Options. Binomial model for option pricing. Continuous model for option pricing - Black - Scholes formula. VaR and CVar. Coherent Risk Measures.

Practice: Practical exercises based on theoretical instructions. The exercises are performed on the blackboard, as well as in using software.

Required Reading:

1. Luenberger, Investment Science, Oxford University Press, New York, 1997.

2. J. C. Hull, Options, Futures and Other Derivatives, Prentice Hall, 2003

3. Roman, Steven: Introduction to the Mathematics of Finance. Springer-Verlag, New York [etc.], 2004.

4. Cvitanic, J., Zapaterro, F., Introduction to the Economics and Mathematics of Financial Markets, MIT Press, 2004.

Weekly Contact Hours: 6	**Lectures:** 4	**Practical work:** 2

Teaching Methods:

Lectures followed by exercises and students' work.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation		written exam	

Practical work		oral exam	50
Preliminary exam(s)	50	…….	
Seminar(s)			
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			