Zał. nr 4 do ZW 64/2012

FACULTY OF PURE AND APPLIED MATHEMATICS

SUBJECT CARD

Name in Polish: Matematyka finansowa
Name in English: Economathematics
Main field of study (if applicable): Applied Mathematics
Specialization (if applicable): Mathematics for Industry and Commerce
Level and form of studies: ~~1st~~/ 2nd* level, full-time ~~/ part-time~~*
Kind of subject: obligatory ~~/ optional~~ / ~~university-wide~~*
Subject code MAP1899
Group of courses YES /~~NO~~*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	30			
Number of hours of total student workload (CNPS)	90	90			
Form of crediting	Examination / ~~crediting with grade~~*	Examination / crediting with grade*	Examination / crediting with grade*	Examination / crediting with grade*	Examination / crediting with grade*
For group of courses mark (X) final course	X				
Number of ECTS points	3	3			
including number of ECTS points for practical (P) classes	1	3			
including number of ECTS points for direct teacher-student contact (BK) classes	1,5	1,5			

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Student has an elementary knowledge of financial markets and discrete models of financial mathematics

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SUBJECT OBJECTIVES

C1 Learning and mastery of key concepts and methods in the field of financial mathematics

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 knows the most important theorems and hypotheses of financial mathematics
PEK_W02 knows the basics of stochastic modeling in financial mathematics
relating to skills:
PEK_U01 can construct mathematical models used in financial mathematics
relating to social competences:
PEK_K01 can by hisself search for information in the literature, even in foreign languages

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours**
Lec 1	Blacka-Scholes model	4
Lec 2	Multidimensional Blacka-Scholes model	2
Lec 3	Feynman-Kac formula and Blacka-Scholes formula	4
Lec 4	Bachelier model	2
Lec 5	Modeling of term structure	4
Lec 6	Vasicek and Cox-Ingerson-Ross models HJM model	4
Lec 7	Calibration of interest rate instruments	2
Lec 8	Subdiffusive Black-Scholes and Bachelier models	4
Lec 9	Fractional Brownian motion in finance	2
Lec 10	Gerber-Shiu model, Esscher transform	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1	Illustration of all models.. Analytical and computer methods. Examples of pricing derivatives.	30
	Total hours	30

TEACHING TOOLS USED
N1. Lecture problem - traditional method. N2. Problem and counting exercises. N3. Consultations. N4. Student's self work - preparation for exercises.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_W01 PEK_W02 PEK_K01	exam
F2	PEK_U01 PEK_K01	oral responses, tests, small tests
P=0.5*F1+0.5*F2		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] A. Weron, R. Weron (1998) Inżynieria finansowa, WNT

SECONDARY LITERATURE:

[1] A. Jakubowski, A. Palczewski, M. Rutkowski, Ł. Stettner (2003) Matematyka finansowa, WNT.
[2] M. Musiela, M. Rutkowski (1997) Martingale methods in financial modelling, Springer.

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

ECONOMATHEMATICS MAP1899

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

MATHEMATICS

AND SPECIALIZATION **MATHEMATICS FOR INDUSTRY AND COMMERCE**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**	Subject objectives***	Programme content***	Teaching tool number***
PEK_W01 (knowledge)	K2MIC_W03	C1	Lec 1-Lec 10	1, 3
PEK_W02	K2MIC_W09	C1	Lec 1-Lec 10	1, 3
PEK_U01 (skills)	K2MIC_U15	C1	Cl 1	2, 3, 4
PEK_K01 (competences)	K2MIC_K06	C1	Lec 1-Lec 10, Cl 1	1, 2, 3, 4

** - enter symbols for main-field-of-study/specialization educational effects

*** - from table above