Zał. nr 4 do ZW 64/2012

FACULTY OF PURE AND APPLIED MATHEMATICS
SUBJECT CARD

Name in Polish: MODELE UBEZPIECZEŃ ŻYCIOWYCH
Name in English: Life insurance models
Main field of study (if applicable): Applied Mathematics
Specialization (if applicable): Financial and Actuarial Mathematics
Level and form of studies: ~~1st~~/ 2nd* level, full-time / ~~part-time~~*
Kind of subject: obligatory ~~/ optional / university-wide*~~
Subject code MAT001564
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)	150				
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	5				
including number of ECTS points for practical (P) classes	2	2			
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 knows and can apply basic concepts of the probability theory

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SUBJECT OBJECTIVES

C1 Study of the classical concepts and acquisition of the knowledge of life insurance mathematics

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 knows the most important concepts of life insurance mathematics
PEK_W02 knows principles of stochastic modeling in life insurance mathematics

relating to skills:
PEK_U01 can construct mathematical models used in life insurance mathematics

relating to social competences:
PEK_K01 can, without assistance, search for necessary information in the literature, also in foreign languages

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours**
Lec 1	Distribution of the future lifetime including probability of survival and death, force of mortality.	2
Lec 2	Life tables	2
Lec 3	Assumptions for fractional ages	2
Lec 4	Analytical laws of mortality	2
Lec 5	Multiple state models with estimation methods of their parameters and estimation methods of future lifetime (including Nelson-Aalen and Kaplan-Meier estimators)	4
Lec 6	Life insurance payable at the moment death and at the end of the year of death	3
Lec 7	Discrete and continuous annuities	3
Lec 8	Net premiums in fully discrete and continuous insurance contracts	4
Lec 9	Commutation functions	2
Lec 10	Gross premiums	2
Lec 11	Pension funds	4
	Total hours	**30**

Form of classes - class		**Number of hours**
Cl 1	Solving of problems illustrating theory given in the lectures, solving of problems from actuarial exams	30
	Total hours	**30**

TEACHING TOOLS USED
N1. Lecture – traditional method. N2. Problem-solving classes. N3. Consultations. N4. Student's self-work – preparation for the classes.

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 presentations, tests
P=0.5*F1+0.5*F2		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] N. L. Bowers i inni „Actuarial Mathematics”, The Society of Actuaries, Itasca, Illinois 1997
[2] H. U. Gerber „Life insurance mathematics”, Springer-Verlag, Berlin 1997
[3] D. Dickson, M. Hardy, H. Waters „Actuarial mathematics for life contingent risks” 2nd ed.; Cambridge University Press, Cambridge 2013

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

LIFE INSURANCE MODELS MAT001564

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **APPLIED MATHEMATICS** AND SPECIALIZATION **FINANCIAL AND ACTUARIAL MATHEMATICS**

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)	K2MST_W03 K2MST_fam_W01	C1	Lec 1- Lec 15	1,3
PEK_W02	K2MST_W09 K2MST_W22 K2MST_fam_W02 K2MST_fam_W03	C1	Lec 1- Lec 15	1,3
PEK_U01 (skills)	K2MST_U15 K2MST_U24 K2MST_U25 K2MST_fam_U01 K2MST_fam_U02 K2MST_fam_U03	C1	Cl 1	2,3,4
PEK_K01 (competences)	K2MST_K06 K2MST_fam_K01 K2MST_fam_K02	C1	Lec 1- Lec 15, Cl 1	1,2,3,4

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

*** - from table above