FACULTY OF PURE AND APPLIED MATHEMATICS
SUBJECT CARD
Name of subject in Polish: Zarządzanie ryzykiem w ubezpieczeniach
Name of subject in English Risk management in insurance
Main field of study (if applicable): Applied Mathematics
Specialization (if applicable): Financial and Actuarial Mathematics
Profile: academic / practical*
Level and form of studies: 2nd level / full-time /
Kind of subject: optional
Subject code
Group of courses YES

	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			60	
Form of crediting	Examination				
For group of courses mark (X) final course	X				
Number of ECTS points	3			2	
including number of ECTS points for practical classes (P)	2			2	
including number of ECTS points corresponding to classes that require direct participation of lecturers and other academics (BU)	1.5			1.5	

*delete as not necessary

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES
1. Student knows and can apply basic concepts of the probability theory
2. Student knows and can apply basic concepts of actuarial mathematics including life and non-life insurance.
3. Student knows and can apply basic concepts of reserving in life and non-life insurance mathematics

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SUBJECT OBJECTIVES
C1 Study of the classical concepts and acquisition of the knowledge of risk management in life and non-life insurance

SUBJECT EDUCATIONAL EFFECTS
relating to knowledge:

PEK_W01 knows the most important concepts of risk management in life and non-life
    insurance mathematics
PEK_W02 knows principles of stochastic modeling in risk management

relating to skills:
PEK_U01 can construct mathematical models and apply methods used in risk management in
    life and non-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	
Lecture	**Number of hours**
Lec 1 Risk management in insurance, actuarial function, risk management function	2
Lec 2 Capital management, risk appetite, risk measures (including RAROC, RORAC)	2
Lec 3 Solvency II: capital requirements, standard formula, internal models, risk categories	6
Lec 4 Profitability and risk exposure tests, monitoring of actuarial assumptions or parameters	4
Lec 5 Risk exposure reduction methods, methods and instruments of risk transfer including alternative risk transfers (ART)	4
Lec 6 Proportional and non-proportional reinsurance as method of risk exposure reduction	4
Lec 7 Actuarial pricing in life and non-life insurance, risk factors.	2
Lec 8 Application of derivatives in insurance	3
Lec 9 Pricing of catastrophe bonds.	3
Total hours	**30**
Project	**Number of hours**
Proj 1 Preparation and presentations of projects illustrating theory given in the lectures.	30
Total hours	**30**
TEACHING TOOLS USED	
N1. Lecture – traditional method and presentations N2. Student partial project presentation and final presentation N3. Consultations N4. Student's self-work – work on the project development	

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation (F – forming during semester), P – concluding (at semester end)	Learning outcomes code	Way of evaluating learning outcomes achievement
F1	PEK_W01 PEK_W02 PEK_K01	Exam
F2	PEK_U01 PEK_K01	Partial project presentations, final project presentation
P=0.5*F1+0.5*F2		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] N. L. Bowers and others, „Actuarial mathematics", The Society of Actuaries, Itasca, Illinois, 1997.

[2] H. U. Gerber, „Life insurance mathematics", Springer-Verlag, Berlin, 1997.

[3] C. D. Daykin and others, „Practical risk theory for actuaries", Chapman & Hall, London, 1996.

[4] R. Kaas, M. Gooveaerts, J. Dhaene, M. Denuit „Modern actuarial Risk Theory", Springer-Verlag, Berlin Heidelberg, 2008.

[5] P.M. Booth, R. G. Chadburn, S. Haberman et al. „Modern actuarial theory and practice" 2nd ed.; Chapman & Hall, 2005

[6] M. V. Wüthrich, M. Merz,"Financial Modeling, Actuarial Valuation and Solvency in Insurance", Springer-Verlag Berlin Heidelberg, 2013.

[7] DIRECTIVE 2009/138/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)

SECONDARY LITERATURE:

[1] L. Hölscher, P. Harding, G. M. Becker, „ Financing the Embedded Value of Life Insurance Portfolios", HfB – Working Paper Series, 2005.

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

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