



Subject card

Subject name and code	FINANCIAL AND INSURANCE MATHEMATICS, PG_00058552						
Field of study	Economic Analytics						
Date of commencement of studies	October 2022	Academic year of realisation of subject				2022/2023	
Education level	first-cycle studies	Subject group				Obligatory subject group in the field of study Subject group related to scientific research in the field of study	
Mode of study	Part-time studies	Mode of delivery				at the university	
Year of study	1	Language of instruction				Polish	
Semester of study	2	ECTS credits				4.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Economic Analysis and Finance -> Faculty of Management and Economics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Krystian Zawadzki				
	Teachers		dr hab. inż. Krystian Zawadzki				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	8.0	16.0	0.0	0.0	0.0	24
	E-learning hours included: 0.0						
Matematyka finansowa i ubezpieczeniowa - Moodle ID: 28981 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28981							
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	24		10.0		66.0	100
Subject objectives	Identifies mathematical concepts and tools used in finance, banking and insurance						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_U04] formulates logical solutions to complex or unstructured problems		analyzes the influence of various factors which influence the studied phenomenon, striving to obtain an optimal solution			[SU2] Assessment of ability to analyse information	
[K6_W02] demonstrates comprehensive preparation in the field of methods, techniques for formulating and solving problems		selects appropriate methods and mathematical techniques to analyse financial problems			[SW1] Assessment of factual knowledge		
Subject contents	<p>Time value of money - introduction. Simple interest model (SIM), Capital Gains Tax. Compound interest model (CIM) with annual, sub-period and continuous capitalization. The calculation of the mathematical and commercial discount. Valuation of short-term securities. Real capital value, real interest rate. Annuities - without capitalization, with capitalization, equal, compatible and non-compatible. Construction of the loan repayment schedule, APRC calculation. Property insurance - calculation of net and gross premium. Calculation of single and multiple premiums in life, endowment and mixed insurance. The problem of the ruin of the insurance company, calculation of the ruin time.</p>						
Prerequisites and co-requisites							
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade	
	Midterm colloquium		60.0%			60.0%	
	Final Exam		60.0%			30.0%	
	Additional tasks		0.0%			10.0%	

Recommended reading	Basic literature	Podgórska, M., Klimkowska, J. (2022). Matematyka finansowa. Warszawa: Wydawnictwo Naukowe PWN. Redo, M., Prewysz-Kwinto, P. (2021). Matematyka finansowa. Warszawa: Wydawnictwo Naukowe PWN. Otto, W. (2015). Matematyka w ubezpieczeniach. Ubezpieczenia majątkowe. Warszawa: WNT. Błaszczyszyn, B., Rolski, T. (2018). Podstawy matematyki ubezpieczeń na życie. Warszawa: Wydawnictwo Naukowe PWN.
	Supplementary literature	Borowski, J., Golański, R., Kasprzyk, K., Melon, L., Pogórska, M. (2003). Matematyka finansowa: przykłady, zadania, testy, rozwiązania. Wałbrzych: Szkoła Główna Handlowa. Cegłowski, B., Podgórski, B. (2021). Finanse z arkuszem kalkulacyjnym. Warszawa: Wydawnictwo Naukowe PWN. Sobczyk, M. (2011). Matematyka finansowa: podstawy teoretyczne, przykłady, zadania. Warszawa: Agencja Wydawnicza Placet. Kellison, S. G. (2008). Theory of interest. New York: McGraw-Hill. Piasecki, K., Ronka-Chmielowiec W. (2011). Matematyka finansowa. Warszawa: C.H. Beck.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Calculation of the time value of money. Calculation of the future value of investments. APRC calculation. Calculation of premiums in property and life insurance.	
Work placement	Not applicable	