



## Subject card

Subject name and code	Financial and Insurance Mathematics, PG_00050162						
Field of study	Economic Analytics						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
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	Full-time studies	Mode of delivery			e-learning		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Economic Analysis and Finance -> Faculty of Management and Economics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Potrykus					
	Teachers	dr inż. Marcin Potrykus					
Lesson type and method of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	0.0	0.0	0.0	45
	E-learning hours included: 45.0						
Matematyka finansowa i ubezpieczeniowa (sem. letni 2020/21) - Moodle ID: 13356 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13356">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13356</a>							
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	45	5.0	25.0	75		
Subject objectives	Introducing students to the basic mathematical concepts and tools used in finance, banking and insurance.						
Learning outcomes	Course outcome	Subject outcome	Method of verification				
	[K6_W01] Has a basic knowledge of the nature of economic sciences and their place in the system of social sciences and relations to other areas of science.	Student knows the valuation methods of the time value of money and their importance in the economy..	[SW1] Assessment of factual knowledge				
	[K6_U08] Has the ability to use mathematical and IT tools to analyse economic phenomena and make decisions by economic entities.	Student uses a learned mathematical tools to analyze financial events in banking and insurance.	[SU4] Assessment of ability to use methods and tools				

Subject contents	<p>LECTURES: Time value of money – introduction; Simple interest, discount rate, compound interest, continuous compounding; Inflation rate and real rate of interest; Valuation of short-term securities; Annuities; Payments varying in arithmetic and geometric progression; Repayment of debts analysis'; Valuation of long-term securities; Fundamentals of actuarial mathematics; Using a spreadsheet in financial mathematics.</p> <p>TUTORIALS: Simple interest, discount rate, compound interest, continuous compounding; Nominal, equivalent, effective and average rate of interest; Inflation rate and real rate of interest; Valuation of short-term securities (bonds and other securities); Annuity – immediate and annuity – due ; Perpetuities; Annuities payable more and less frequently than interest is convertible; Payments varying in arithmetic and geometric progression; Repayment of debts analysis'; Valuation of long-term securities; Introduction to the valuation of derivative instruments; Life expectancy tables; The average time of life; Annuities and life insurance.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	60.0%	80.0%
	Final Exam	60.0%	20.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Kellison S. G., <i>The Theory of Interest</i>, McGraw-Hill, 2008;</li> <li>2. Podgórska M., Klimkowska J., <i>Matematyka finansowa</i>, Wydawnictwo Naukowe PWN, Warszawa 2020;</li> <li>3. Cegłowski B., Podgórski B., <i>Finanse z arkuszem kalkulacyjnym</i>, Wydawnictwo Naukowe PWN, Warszawa 2014.</li> <li>4. Kowalczyk P., Poprawska E., Ronka-Chmielowiec W., <i>Metody aktuarialne</i>, Wydawnictwo Naukowe PWN, Warszawa 2013</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Borowski J., Golański R., Kasprzyk K., Melon L., Pogórska M., <i>Matematyka finansowa: przykłady, zadania, testy, rozwiązania</i>, SGH, Warszawa 2003;</li> <li>2. Piasecki K., Ronka-Chmielowiec W., <i>Matematyka finansowa</i>, C. H. Beck, Warszawa 2011.</li> <li>3. Błaszczyszyn B., Rolski T., <i>Podstawy matematyki ubezpieczeń na życie</i>, WNT 2004.</li> <li>4. Hull J., <i>Kontrakty terminowe i opcje. Wprowadzenie</i>, WIG Press, Warszawa 1998.</li> <li>5. Sobczyk M., <i>Matematyka finansowa: podstawy teoretyczne, przykłady, zadania</i>, Agencja Wydawnicza Placet, Warszawa 2011</li> </ol>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Calculation of the time value of money, the future value of investments, credit instalments, the value of pensions, insurance premiums.		
Work placement	Not applicable		