



Subject card

Subject name and code	Financial Mathematics, PG_00037627						
Field of study	Economics						
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			5.0		
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 inż. Marcin Potrykus				
	Teachers		dr inż. Marcin Potrykus				
Lesson types and methods 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 - Moodle ID: 2127 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=2127">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=2127</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		10.0		70.0	125
Subject objectives	Introducing students to the basic mathematical concepts and tools used in finance and banking.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W07] has the knowledge of basic quantitative and qualitative methods used in economic sciences		Student identifies the valuation methods of the time value of money.		[SW1] Assessment of factual knowledge		
	[K6_U11] has the ability to understand, analyse and evaluate economic processes and phenomena using quantitative and qualitative methods		Student analyses the impacts of selected factors on the value of the investment. Student chooses the optimal credit offer. Student calculates APR. Student constructs an optimal investment portfolio.		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
[K6_U15] can improve oneself through the systematic acquisition of knowledge and skills		Student sees the need for expanding the knowledge and can develop it.		[SU2] Assessment of ability to analyse information			
Subject contents	<p>LECTURES: Time value of money – introduction; Simple interest, discount rate, compound interest, continuous compounding; Inflation rate and real rate of interest; Optimal portfolio theory; Valuation of short-term securities; Annuities; Payments varying in arithmetic and geometric progression; Repayment of debts analysis; Valuation of long-term securities; 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; Optimal portfolio theory; 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.</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%	40.0%
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 2013;</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		