GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Financial Mathematics, PG_00068524		
Field of study	MATEMATYKA FINANSOWA		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
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	1	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Finance -> Faculty of Management and Economics -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	Jarosław Wróblewski	
	Teachers	Jarosław Wróblewski	

Lesson types

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

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	4.0	72.0	100

Subject objectives

Preparation of students to solve decision-making problems in finance using the tools of financial mathematics, based on knowledge of the time value of money and methods of valuing financial instruments, as well as the development of attitudes related to logical thinking and the precise formulation of solutions in the context of economic analyses.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U04] develops logical solutions to complex or unstructured problems, even under conditions of uncertainty.	is able to perform calculations related to the valuation of financial instruments using appropriate mathematical models (interest, discounting, capitalization, annuity calculus) and analyze their impact on the future and present value of cash flows.	[SU2] Ocena umiejętności analizy informacji
[K6_W02] possesses advanced knowledge of methods and techniques that enable precise formulation and effective problem solving.	knows and understands the principles of the mathematical description of the time value of money, with particular emphasis on various interest rate models, discounting methods, and annuity calculus, in the context of analyzing financial and economic decisions.	[SW1] Ocena wiedzy faktograficznej

Subject contents

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.
Valuation of long-term securities.
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.

Prerequisites and co-requisites

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Written test</td><td>60.0%</td><td>60.0%</td></tr>
<tr><td>Written exam with practical tasks</td><td>60.0%</td><td>40.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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.</td></tr>
<tr><td>Supplementary literature</td><td>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.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Calculation of the time value of money.
Calculation of the future value of investments.
APRC calculation.
Calculation of premiums in property and life insurance.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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