University of Gdańsk

Subject card

Subject name and code	Introduction to Financial Mathematics, PG_00172743		
Field of study	Mathematical Modeling and Data Analysis		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Bachelor's studies	Subject group	Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	6.0
Learning profile	academic	Assessment form	exam
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	dr Marta Frankowska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	0.0	0.0	60

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	60	10.0	80.0	150

Subject objectives

Familiarize students with the structure of interest rates, issues related to the analysis and modeling of financial flows.

Learning outcomes

Course outcome	Subject outcome	Method of verification

Subject contents

1. Capital accumulation and discount functions: simple capitalization, compound capitalization. Interest rates: effective, nominal, continuous.
2. Momentum structure of interest rates.
3. Reference rates WIBOR and WIBID.
4. Annuities annuities with fixed and variable installments, payable in arrears and payable in advance, perpetual and deferred, annuities whose payments do not coincide with the capitalization period, continuous annuities, present value and accumulated value of annuities.
5. Loans with fixed installments and fixed principal payments.
6. Selected ratios for evaluating financial investments including net present value (NPV) and internal rate of return (IRR).
7. Bonds.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written exam	51.0%	60.0%
colloqium	51.0%	40.0%
observation of the student's attitude	100.0%	0.0%

Recommended reading

Basic literature	1. M. Podgórska, J. Klimkowska Financial Mathematics, PWN, Warsaw, 2005. 2. Capital Markets. Financial mathematics I, P. Jaworki, K. M. Jaworska.
Supplementary literature	1. Financial engineering, R. Weron, WNT, Warsaw, Poland. 2. Mathematical modeling in finance and insurance, P. Jaworski, J. Micał, Poltext, Warsaw 2005.
eResources addresses	

Example issues/ example questions/ tasks being completed	1. Capital accumulation processes (simple interest, compound interest, continuous capitalization, annual and subperiodic interest rate, nominal and effective rate, minimum and maximum interest). 2. Trade discount, treasury bills, bills of exchange. 3. Inflation, real interest rate and real value of capital. 4. Time value of capital model, principle of equivalence of capitals. 5. Annuities payable in arrears and payable in advance, deferred annuities, perpetual annuities, annuities with fixed installments, annuities with variable installments: series of fixed, forming an arithmetic and geometric series, generalized annuity type I and II. 6. Loans, the principle of equivalence of debt and installments, different models of loan repayment, mortgages - WIBOR-dependent rate, loan repayment plan, the real interest rate on a loan. 7. Measures for evaluating financial investments - NPV (net present value of investment) and IRR (internal rate of return).
Work placement	Not applicable

Document generated electronically. Does not require a seal or signature.