



COURSE SPECIFICATION

Course code	full-time studies	Z-ZB-E-202
	part-time studies	-
Course title in English	Financial mathematics	
Course title in Polish	Matematyka finansowa	
Valid from academic year	2025/2026	

PLACEMENT IN THE TEACHING PROGRAM

Programme of study	BUSINESS MANAGMENT
Level of education	1st degree
Studies profile	academic
Form and mode of study	full-time programme
Scope	all
Academic unit responsible for the course	Department of Mathematics and Physics
Course coordinator	prof. dr hab. Artur Maciąg
Approved by	dr hab. inż. Dariusz Bojczuk, prof. uczelni

GENERAL CHARACTERISTIC OF THE COURSE

Teaching block	Subject of general education	
Course status	Obligatory	
Language of instruction	English	
Semester of delivery	full-time studies	Semester II
	part-time-studies	-
Prerequisites	None	
Exam (YES/NO)	YES	
ECTS	5	

Method of conducting classes		lecture	classes	laboratory	project	other
Number of hours per semester	full-time	30	30			
	part-time					



LEARNING OUTCOMES

Category	Outcome code	Course learning outcomes	Reference to the directional learning effect
Knowledge	W01	Has knowledge of the causes and methods of changes in the value of money over time. Can recognize methods of changes in the value of money (simple interest, compound interest, discounting, cash flows). Knows methods of repaying loans and determining the size of annuities. Has knowledge of the use of financial mathematics instruments in practice and making financial decisions.	ZB1_W06
	W02	Has knowledge of financial mathematics useful for formulating and solving problems in economics and social sciences. Knows ways to solve simple mathematical models relating to economic phenomena.	ZB1_W06
Skills	U01	Is able to use the tools of financial mathematics to analyse processes and phenomena occurring in the economy, particularly in banking and non-bank financial institutions.	ZB1_U01
	U02	Is able to analyse typical financial processes and phenomena in order to solve emerging problems. Is able to assess the usefulness of typical mathematical methods and choose a method to solve problems arising in financial practice.	ZB1_U01
Social competences	K01	Recognizes the need and opportunity to acquire mathematical knowledge necessary to solve problems encountered in practice.	ZB1_K01
	K02	Is able to expand acquired knowledge and skills in the field of mathematical analysis tools that enable modelling of real phenomena.	ZB1_K02

COURSE CONTENT

Method of conducting classes	Course content
lecture	The sources of changes in the value of money over time. Time calculation. Simple interest, interest rate, present and future value, simple discounting. Trade discount, discount rate, advance payment loans, bills of exchange, treasury bills, bonds. Compound interest – bank deposits, present and future value, discounting, effective interest. Cash flows – present and future value, payments in arrears and in advance, consistent and inconsistent with capitalization periods. Loan repayments, negotiated, fixed and decreasing installments, cost of credit, repayment plan, the annual percentage rate of charge (APRC). Annuity calculus. Valuation elements, net present value (NPV). Using a spreadsheet for calculations related to financial mathematics.
classes	The sources of changes in the value of money over time. Time calculation. Simple interest, interest rate, present and future value, simple discounting. Trade discount, discount rate, advance payment loans, bills of exchange, treasury bills, bonds. Compound interest – bank deposits, present and future value, discounting, effective interest. Cash flows – present and future value, payments in arrears and in advance, consistent and inconsistent with capitalization periods. Loan repayments, negotiated, fixed and decreasing installments, cost of credit, repayment plan, the annual percentage rate of charge (APRC). Annuity calculus. Valuation elements, net present value (NPV). Two tests.



METHODS FOR VERIFYING LEARNING OUTCOMES

Outcome code	Learning outcomes verification methods					
	Oral examination	Written examination	Test	Project	Report	Other
W01		X	X			
W02		X	X			
U01		X	X			
U02		X	X			
K01						X
K02						X



FORM AND CONDITIONS OF ASSESSMENT

Form of classes	Assessment type	Assessment Criteria
lecture	Examination	Obtaining at least 50% of the points in the written exam.
classes	Credit with grade	Two tests, scored activity during classes. Obtaining at least 50% of the possible points from tests and activity during classes.

STUDENT WORKLOAD

ECTS Balance							
No.	Activity type	Student workload					Unit
		full-time					
1.	Scheduled contact hours	W	C	L	P	S	h
		30	30				
2.	Other (consultations, exams)	4	2				h
3.	Total number of contact hours	66					h
4.	Number of ECTS credits for contact hours	2,6					ECTS
5.	Number of hours of independent student work	59					h
6.	Number of ECTS points that a student obtains through independent work	2,4					ECTS
7.	Workload related to practical classes	63					h
8.	Number of ECTS credit points which a student receives for practical classes	2,5					ECTS
9.	Total number of hours of a student's work	125					
10.	ECTS credits for the course 1 1 ECTS credit =25 student learning hours	5					ECTS

W - LECTURE C - CLASSES L - LABORATORY P - PROJECT S - SEMINAR

READING LIST

1. Raymond H. Chan , Yves ZY. Guo , Spike T. Lee , Xun Li, Financial Mathematics, Derivatives and Structured Products, Springer, 2019
2. Qin Lu, Introduction to Financial Mathematics, Taylor & Francis, 2024
3. Campolieti G., Makarov R., Financial Mathematics, CRC Press, 2014
4. Buchanan J. R., An Undergraduate Introduction to Financial Mathematics, World Scientific Publishing Company, 2012