



COURSE DESCRIPTION
Financial and Actuarial Mathematics
Academic year 2026-2027

1. Programme-related data

1.1. Higher Education Institution	Universitatea Babeș Bolyai
1.2. Faculty	Business
1.3. Department	Business
1.4. Field	Business Administration
1.5. Level of study	Bachelor
1.6. Degree programme / Qualification	Business Administration/Bachelor in Economic Studies
1.7. Form of education	Full time

2. Information regarding the discipline

2.1. Name of the discipline	Financial and Actuarial Mathematics			Codul disciplinei	ILE0082
2.2. Course coordinator	Assoc.prof. Gabriela Reghina PETRUȘEL, PhD				
2.3. Seminar coordinator	Assoc.prof. Gabriela Reghina PETRUȘEL, PhD				
2.4. Year of study	2	2.5. Semester	1	2.6. Type of assessment	Progress check
2.7. Course status	Optional			2.8. Course type	Specialisation subject

3. Total estimated time (hours per semester of teaching activities)

3.1. Number of hours per week	3	of which: 3.2. course	2	3.3. seminar/ laboratory/ project	1
3.4. Total of hours in the curriculum	42	of which: 3.5. course	28	3.6. seminar/ laboratory	14
Time allocation for individual study (IS) and self-taught activities (ST)					hours
Learning from textbooks, course materials, bibliography, and notes (IS)					12
Additional research in the library, on subject-specific electronic platforms, and on-site					12
Preparing seminars/ laboratories/ projects, assignments, reports, portfolios, and essays					5
Tutoring (professional guidance)					2
Examinations					2
Other activities					-
3.7. Total hours of individual study (IS) and self-taught activities (ST)				33	
3.8. Total hours per semester				75	
3.9. Number of credits				3	

4. Prerequisites (where applicable)

4.1. curriculum-related	
4.2. skills-related	

5. Specific conditions (where applicable)

5.1. course-related	classroom with computer and projector;
5.2. seminar/laboratory-related	classroom with computer and projector;

6.1. Competencies resulting from the completion of the degree programme

Professional competencies	
Competency code	Competency
PC1	Gathering, processing and analysing data regarding the interaction between a company/an organisation and the external environment
PC2	Providing assistance for running a company/an organisation as a whole
Transversal competencies	
Competency code	Competency
TC1	Implementing ethical principles, norms and values within one's own rigorous, efficient, and responsible strategy of work

6.2. Learning outcomes relevant to the degree programme

Learning outcomes targeted by the subject		
Competency code	Knowledge and comprehension	Specific academic skills
PC1 PC2 TC1	1. The graduate has knowledge of accounting, processing, and analysing of economic and financial information required for an effective organisation and management of businesses.	1. The graduate has the necessary skills to use methods and techniques specific to the financial and accounting management of an enterprise as a whole, specialised software included.

7. Subject-specific learning outcomes

Knowledge and understanding
1. The student explains the concepts of simple and compound interest, capitalisation, discounting and financial discounts, specifying their relationships and the conditions for their application in financial transactions.
2. The student describes the principle of financial equivalence and the characteristics of instalment payments, distinguishing between annuities due and ordinary annuities, finite annuities and perpetuities, and immediate and deferred annuities
3. The student explains loan repayment mechanisms involving a single payment or instalments, highlighting the relationships between interest, principal repayment, the instalment amount and the outstanding loan balance.
Specific academic skills
1. The student calculates interest, financial discounts, present and future values of capital, and determines the parameters of equivalent financial transactions using appropriate formulas.
2. The student determines the present and future values of payment streams, including annuities and payments made several times per year, and compares payment options on the basis of financial equivalence.
3. The student prepares and verifies loan amortisation schedules involving equal instalments and equal principal repayments, interpreting the results to support the choice of a financing option.

8. Contents

8.1. Course	Teaching and learning methods	Remarks
Reviewing concepts of financial mathematics ✓ The notion of simple interest; ✓ The elements of simple interest; ✓ Another formula for simple interest; ✓ Number and divisor method;	interactive discussion,	one lecture
Simple interest rate operations ✓ Average replacement amount; ✓ Average replacement maturity; ✓ Average replacement percentage;	interactive discussion,	one lecture
The notion of compound interest ✓ The elements of compound interest; ✓ Real percentage, nominal percentage and instant interest;	interactive discussion,	one lecture
Operations with compound interest rate ✓ Average replacement amount; ✓ Average replacement maturity; ✓ Average replacement percentage;	interactive discussion,	one lecture
Discount operations ✓ simple discount compound discount	interactive discussion,	one lecture
Real discount percentage	interactive discussion,	one lecture
Operations equivalent under discount	interactive discussion,	one lecture
Installment payments	interactive discussion,	one lecture
Impressed annuities;	interactive discussion,	one lecture
Temporary anticipated annuities	interactive discussion,	one lecture
Impacted fractionalities	interactive discussion,	one lecture
Mixed staggered payments -Revision	interactive discussion,	one lecture
Repayment of the single payment	interactive discussion,	one lecture
Repayment instages	interactive discussion,	one lecture
Loan repayment through end-of-period annuities at a constant annual interest rate	exercise, case study	one seminar
Revision - solving a model for the final written test	interactive discussion,	one lecture
Final written test	interactive discussion,	one lecture
Bibliography		
1. Horiana Tudor, Ovidiu Popescu, <i>Matematici financiare si actuariale</i> , Editura Albastra, 2004 220 p. 2. Diana Andrada Filip <i>Matematici financiare si actuariale</i> 3. Cristian Chifu, Gabriela Petrusel, <i>Matematica aplicata in administrarea afacerilor</i> , Casa Cartii de Stiinta, 2012. 4. Wilkes M., <i>Mathematics for Business, Finance and Economics</i> , International Thomson Business Press, 1999.		
8.2. Seminar/ laboratory	Teaching and learning methods	Remarks
Reviewing concepts of financial mathematics ✓ The notion of simple interest; ✓ The elements of simple interest; ✓ Another formula for simple interest; Number and divisor method;	exercise, case study	one seminar

Simple interest rate operations ✓ Average replacement amount; ✓ Average replacement maturity; Average replacement percentage;	exercise, case study	one seminar
The notion of compound interest ✓ The elements of compound interest; ✓ Real percentage, nominal percentage and instant interest;	exercise, case study	one seminar
Operations with compound interest rate ✓ Average replacement amount; ✓ Average replacement maturity; Average replacement percentage;	exercise, case study	one seminar
Discount operations ✓ simple discount; ✓ compound discount;	exercise, case study	one seminar
Real discount percentage Operations equivalent under discount;	exercise, case study	one seminar
Installment payments Impressed annuities;	exercise, case study	one seminar
Temporary anticipated annuities	exercise, case study	one seminar
Impacted fractionalities	exercise, case study	one seminar
Mixed staggered payments - Revision	exercise, case study	one seminar
Repayment of the single payment	exercise, case study	one seminar
Repayment instages	exercise, case study	one seminar
Loan repayment through end-of-period annuities at a constant annual interest rate	exercise, case study	one seminar
Revision - solving a model for the final written test	exercise, case study	one seminar
Bibliography		
1. Horiana Tudor, Ovidiu Popescu, <i>Matematici financiare si actuariale</i> , Editura Albastra, 2004 220 p. 2. Diana Andrada Filip <i>Matematici financiare si actuariale</i> 3. Cristian Chifu, Gabriela Petrusel, <i>Matematica aplicata in administrarea afacerilor</i> , Casa Cartii de Stiinta, 2012. 4. Wilkes M., <i>Mathematics for Business, Finance and Economics</i> , International Thomson Business Press, 1999.		

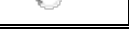
9. Evaluation

- The same evaluation criteria are maintained for all exams sessions. The components of the evaluation process carried out during the semester cannot be recovered/redone in the examination sessions.
- To be able to accumulate the points obtained during the semester, it is mandatory to obtain a minimum of 5 (five) in the final exam (written/oral).

Type of activity	9.1 Evaluation criteria	9.2 Evaluation methods	9.3 Percentage in the final grade
9.4. Course	Correct use of financial mathematics concepts; selection and application of appropriate formulas for interest, financial discounts, equivalent transactions, instalment payments and loan repayment; accuracy of calculations; justification of solution steps and interpretation of results.	Written test (in sesiion)	60%
9.5. Seminar/ laboratory	Clear definition of the financial situation analysed and the	Case study report (during the semester)	30%

	assumptions made; selection of appropriate calculation methods; accuracy of calculations and the loan amortisation schedule, where applicable; comparison of the options analysed; justification of conclusions; clarity of presentation and acknowledgement of sources used.		
	Regular participation in seminar activities; engagement in solving exercises and case studies; explanation and justification of proposed solutions; relevance of contributions and correct use of subject-specific terminology.	Active participation in seminars	10%
9.6 Minimum standard for passing			
- Knowledge of fundamental concepts and their application to examples. - Economic interpretation of the results obtained.			

10. SDG labels (Sustainable Development Goals)

		Sustainable Development Generic Label						
								
								
								Nu se aplică nici o etichetă
								X

Date of entry:

22.05.2026

Signature of course coordinator

Gabriela Regina PETRUȘEL, PhD

Signature of seminar coordinator

Gabriela Regina PETRUȘEL, PhD

Date of approval in the department:

27.05.2026

Signature of the head of department

Prof. Ioan Cristian CHIFU, PhD