



SYLLABUS
Financial and Actuarial Mathematics
Academic year 2025-2026

1. Information regarding the program

1.1. Higher education institution	Universitatea Babeș Bolyai
1.2. Faculty	Business
1.3. Department	Business
1.4. Field of study	Business Administration
1.5. Study cycle	Bachelor
1.6. Study 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				Discipline code		ILE0082			
2.2. Course coordinator			Assoc.prof. Gabriela Petrușel, PhD								
2.3. Seminar coordinator			Assoc.prof. Gabriela Petrușel, PhD								
2.4. Year of study		2	2.5. Semester		1	2.6. Type of evaluation		C	2.7. Discipline regime		elective

3. Total estimated time (hours/semester of didactic activities)

3.1. Hours per week	3	of which: 3.2 course	2	3.3 seminar/laboratory	1
3.4. Total hours in the curriculum	42	of which: 3.5 course	28	3.6 seminar/laboratory	14
Time allotment for individual study (ID) and self-study activities (SA)					hours
Learning using manual, course support, bibliography, course notes (SA)					12
Additional documentation (in libraries, on electronic platforms, field documentation)					12
Preparation for seminars/labs, homework, papers, portfolios and essays					5
Tutorship					2
Evaluations					2
Other activities:					-
3.7. Total individual study hours					33
3.8. Total hours per semester					75
3.9. Number of ECTS credits					3

4. Prerequisites (if necessary)

4.1. curriculum	
4.2. competencies	

5. Conditions (if necessary)

5.1. for the course	classroom with computer and projector;
5.2. for the seminar /lab activities	classroom with computer and projector;



6.1. Specific competencies acquired

Professional/essential competencies	<p>C1. Gathering, processing, and analysing data regarding the interaction between a company/ an organisation and the external environment.</p> <p>C1.3. Assessing critically and constructively the way of explaining and/or solving problems referring to the economic influence of the external environment on a company/an organization.</p> <p>C2. Providing assistance for running a company/ an organisation as a whole.</p> <p>C2.2. Explaining and interpreting the relationships among various entities in a company/ an organisation.</p>
Transversal competencies	<p>CT1. Implementing ethical principles, norms, and values within one's own rigorous, efficient, and responsible strategy of work.</p>

6.2. Learning outcomes

Knowledge	<p>The student has knowledge of accounting, processing, and analysis of economic and financial information required for an effective organisation and management of businesses.</p> <ul style="list-style-type: none">• Know mathematical methods and use computational technologies to perform analyses and design solutions to specific problems. Know methods of collecting data and making statistics for testing and evaluation in order to generate statements and pattern predictions, in order to discover useful information in the decision-making process.
Skills	<p>The student 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.</p> <ul style="list-style-type: none">• Use dedicated software for data analysis, including statistics, spreadsheets and databases, explore the possibilities to prepare reports to administrators, superiors or customers.• Performs systems analysis and calculates to what extent changes could affect the results
Responsibility and autonomy:	



7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	<ul style="list-style-type: none"> acquire knowledge and skills in several areas of mathematics, economics and business critical applications; developing skills of mathematical modelling of business processes; communication skills in mathematical language;
7.2 Specific objective of the discipline	<ul style="list-style-type: none"> the ability to understand the concept of financial transaction; the ability to use the mathematical language in understanding economic phenomena; the ability to interpret phenomena and economic trends through the mathematical apparatus;

8. Content

8.1 Course	Teaching 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 ✓ Operations equivalent under discount	interactive discussion,	one lecture
Installment payments ✓ 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
Revision - solving a model for the final written test	interactive discussion,	one lecture
Final written test	interactive discussion,	one lecture
Bibliography: 1. Horia Tudor, Ovidiu Popescu, <i>Matematici financiare si actuariale</i> , Editura Alabastra, 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	Metode de predare	Observații
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
Revision - solving a model for the final written test	exercise, case study	one seminar
Final written test	exercise, case study	one seminar
Bibliography: 5. Horia Tudor, Ovidiu Popescu, <i>Matematici financiare si actuariale</i> , Editura Alabastra, 2004 220 p. 6. Diana Andrada Filip <i>Matematici financiare si actuariale</i> 7. Cristian Chifu, Gabriela Petrusel, <i>Matematica aplicata in administrarea afacerilor</i> , Casa Cartii de Stiinta, 2012. Wilkes M., <i>Mathematics for Business, Finance and Economics</i> , International Thomson Business Press, 1999.		



9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

- The course content is correspondence with what is done in other universities in the country and abroad.
- To adapt to the market demands of the contents meetings were held with representatives of the business community.

10. 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).

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	<ul style="list-style-type: none">• correct logical and coherent application of the concepts learned• logical and accurate explanation and interpretation of the results;	Written test (final week of the semester)	60%
10.5 Seminar/laboratory	<ul style="list-style-type: none">• the ability to apply concepts learned in practice• correct logical and coherent application of the concepts learned• economic explanation of the results;• interest in the individual preparation throughout the whole semester	Applicative activities (projects, essays, reports, etc.) – during the semester	30%
		the active participation in seminars	10%
10.6 Minimum standard of performance			
<ul style="list-style-type: none">• Knowledge of the fundamental concepts and their application examples;• The economic interpretation of the results.			



11. Labels ODD (Sustainable Development Goals)¹

N/A

Date:

07.04.2025

Signature of course coordinator

Gabriela Reghina PETRUȘEL, PhD

Signature of seminar coordinator

Date of approval:

10.04.2025

Signature of the head of department

Ioan Cristian CHIFU, PhD

¹ Keep only the labels that, according to the [Procedure for applying ODD labels in the academic process](#), suit the discipline and delete the others, including the general one for *Sustainable Development* – if not applicable. If no label describes the discipline, delete them all and write „*Not applicable*.”.