

**Italian code: STAT-04/A**

**Credits: 9**

**Course: Financial Mathematics**

**Main language of instruction: Italian**

**Other language of instruction: English**

### Head instructor

**Professor Andrea SCOZZARI - [andrea.scozzari@unicusano.it](mailto:andrea.scozzari@unicusano.it)**

### Objectives

The course aims to provide students with the basic tools of classical financial mathematics. In particular, financial annuities, amortizations, and the evaluation of financial flows constitute the fundamental part of the course. The in-depth study of these topics will allow students to acquire the specific knowledge that characterizes the degree course in Business Economics and Management. The course on “Financial Mathematics” has the following main objectives:

1. Introduce the basics of classical financial mathematics (laws and financial regimes)
2. Introduce and deepen the concepts related to Financial Annuities and Amortizations
3. Introduce and deepen the concepts related to the evaluation of financial flows.

### Course structure

- Introduction to Financial Mathematics
- Basic Financial Operations
- Annuities
- Amortizations
- Evaluation of Financial Flows
- Duration and Immunization

## Competencies

### A. Knowledge and understanding:

By the end of the course, the student will have knowledge of the basic topics and tools of classical financial mathematics. In particular, they will have acquired knowledge regarding: financial regimes, amortizations, financial annuities, evaluation of investment projects, and time indices. Additionally, the student will gain an understanding of the basic concepts of financial immunization. Finally, through Activities, which consist of exam simulations, students will have the opportunity to deepen their understanding of the topics covered during the course as well as assess their own preparation.

### B. Applying knowledge and understanding:

The student will be able to use the acquired knowledge in financial applications. The topics related to the study of time indicators, with particular regard to financial duration, will also aim to introduce the necessary concepts for the discussion and solution of problems related to the selection and management of financial portfolios.

### C. Learning skills:

By the end of the course, the student will have knowledge of the fundamental concepts of classical financial mathematics. This will enable them to continue their studies with greater maturity and provide the foundation for learning what will be proposed in specialized economics courses

## Syllabus

**Subject 1 – Introduction to Financial Mathematics**

**Subject 2 – Basic Financial Operations**

**Subject 3 – Annuities**

**Subject 4 – Amortizations**

**Subject 5 – Evaluation of Financial Flows**

**Subject 6 – Duration and Immunization Subject 7 – Integrals**

### **Evaluation system and criteria**

For Financial Mathematics, the in-person examination is in Rome at Niccolò Cusano University and it will be organized in written form. On-line examination is not allowed.

The written test consists of 3/4 exercises. The exercises cover the entire course program and they are aimed at verifying the skills acquired. The first question involves solving an exercise on Annuities; the second question involves solving an exercise on the amortization of undivided loans; the third exercise refers either to the problem of evaluating financial flows or to the problem of calculating time indices; the fourth question involves solving an exercise related to basic financial relationships.

The duration of the test is 90 minutes.

### **Bibliography and resources**

#### *1. Materials to consult*

The complete course in English is available (video-lessons and slides). Written Notes are also available in Italian.

#### *2. Recommended bibliography*

1. D.G. Luenberger: Investment Science, Oxford University press, New York, 1998.
2. F. Fabozzi and F. Modigliani: Capital markets: Institutions and Instruments, Prentice Hall, Englewood Cliffs, New Jersey, 1992.