# Mathematics for Economics

## Professor alessandra mainini

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The course aims at providing students with the basic tools and methodologies of financial calculus, together with their application to the real world.

At the end of the course, the student will be able to:

* understand the meaning of financial tools, above all that of interest, and use it to describe a savings plan and a loan amortization;
* deal with basic techniques in modern finance, such as the portfolio valuation, and with financial tools for the evaluation of an investment opportunity.

***COURSE CONTENT***

Interest and discount

Annuities and amortization plans

Evaluation of a projected cash flow

Evaluation of a bond

Yield curve

***READING LIST***

Textbook:

R. Cesari, *Introduzione alla Finanza Matematica*, McGraw-Hill, Milano, 2012.

Suggested reading list

R.L. D’Ecclesia-L. Gardini, *Appunti di Matematica Finanziaria*, vol. 1, Giappichelli, Torino, 2004.

S. Stefani-A. Torriero-G.M. Zambruno, *Elementi di Matematica Finanziaria e cenni di Programmazione Lineare,* Giappichelli, Torino, 2003.

G. Bolamperti-G. Ceccarossi, *Elementi di Matematica Finanziaria e cenni di Programmazione Lineare, esercizi,* Giappichelli, Torino, 2003.

***TEACHING METHOD***

Theoretical lectures and exercises.

During the lesson, students may be asked to discuss and solve, individually or in small groups, some exercises.

The course makes use of the Blackboard platform.

***ASSESSMENT METHOD AND CRITERIA***

The exam is designed to assess reasoning skills and analytical rigor about the topics of the course. Evaluation is considered sufficient if the student shows both the knowledge of the theoretical notions and the methods of calculus, and the skill to apply them in situations of the real world.

For this purpose, there is the possibility, during the period of the course, to solve, individually or in pairs, some homework assignments, which contribute to 25% of the final mark, and which are intended to test the ability to solve financial problems, with the use of convenient calculation tools, and to discuss the final results. The remaining 75% of the evaluation is based on a written final exam, consisting of 3 exercises about the different topics of the course.

If the student decides not to solve the assignments, the evaluation is based 100% on the final exam, consisting of 4 exercises about the different topics of the course.

***NOTES AND PREREQUISITES***

To attend the course successfully, knowledge of some topics of Calculus, such as elementary algebra, real functions of one real variable (in particular exponential and logarithmic functions), and differential calculus, is required. If necessary, the professor will provide students with supplementary material.

Office hours will be available on the personal page of the professor at the website h[ttp://docenti.unicatt.it/](http://docenti.unicatt.it/).