UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Financial Mathematics - 2

2425-2-E1803M051-T2

Learning area

Learning objectives

The aim of the course is to give the main tools for the basics of mathematical finance.

Contents

Sequences and series, integrals, linear algebra and programming, choice under uncertainty, basic notions on financial mathematics and on derivatives

Detailed program

1) Sequences and series: definitions and analysis of the character of series by means of the main criteria.

2) Integrals: definitions, main results and computation.

3) Linear algebra: matrices, vectors and linear systems.

4) Linear programming.

5) Financial mathematics.

6) Bonds and immunization.

7) Introduction to derivatives: binomial model and Black-Scholes model.

Prerequisites

Functions in one and more variables, basic notions of Probability and Statistics.

Teaching methods

The lessons will be held mainly in presence with traditional lectures and exercises. A small percentage (anyway, smaller than 30%) could be taken online (in streaming) in case of necessity.

The course consists in:

-56 hours of lectures;
-24 hours of exercises.

Around 80% of the course will be done in erogative mode, the remaining 20% in interactive mode.

Assessment methods

The final exam is composed by a written part (divided in open questions and exercises) and an optional oral part. The final mark takes into account the scores of the parts above.

For the students that have already passed the exam of Matematica Generale I, two written "in itinere" exams and a further optional oral exam are provided. The second "in itinere" exam is accessible only by students who passed the first one.

Textbooks and Reading Materials

- “Successioni, serie e integrali”, Manuale modulare di Metodi Matematici, vol. 5, a cura di Giovanna Carcano, edizioni Giappichelli Torino

- “Algebra lineare”, Manuale modulare di Metodi Matematici, vol. 4, a cura di Maria Ida Bertocchi, edizioni Giappichelli Torino

- “Elementi di Matematica Finanziaria e cenni di Programmazione Lineare”, S. Stefani, A. Torriero e G. Zambruno, edizioni Giappichelli Torino

- “Matematica Finanziaria classica e moderna”, F. Cacciafesta, edizioni Giappichelli Torino

- "Opzioni e futures", J. Hull

Sustainable Development Goals

QUALITY EDUCATION