UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Basics of Quantitative Finance

2021-3-E3301M160

Learning objectives

Upon completion of the course students will know the basic mathematical approaches to portfolio selection and assets pricing in discrete and continuous time.

Contents

Mathematical models for the valuation and management of bonds, equity and derivatives.

Detailed program

Bonds and immunization: Bonds features and valuation; Interest rate risk and duration: definition, properties and computation; Convexity; Immunization theorems.

Choice under uncertainty and portfolio theory: Axiomatic approach to the problem of choice under uncertainty; Expected utility, certainty equivalent, risk premium; Stochastic dominance of first and second order; Mean variance criterion; Markowitz Portfolio Model.

Derivatives: Valuation of forward and options; Binomial model; Black-Scholes formula.

Prerequisites

Metodi Matematici is a propaedeutic exam.

Teaching methods

Frontal lessons

During Covid-19 emergency classes will be partly offline and partly live streamed

Assessment methods

At the end of the course there will be a written exam and an additional oral exam (at teacher or student discretion)

The written exam consists of two parts:

a. exercises (with open-ended questions) which allow the teachers to evaluate the student's ability to apply the theory in solving problems;
b. theoretical questions where the student is asked to provide complete definitions, statements and proof of theorems, examples and motivations

The oral exam consists of theoretical questions.

Textbooks and Reading Materials

- G. Scandolo. Matematica finanziaria. AMON 2013
- J. C. Hull. Opzioni, futures e altri derivati. Italian edition by E. Barone. Pearson (VI edition).

Semester

First semester

Teaching language

Italian