



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Metodi Matematici - 1

2122-2-E3301M131-T1

Learning objectives

Aim of this course is to provide financial and mathematical tools useful to applications in economic field. Students should be able to define and then solve the proposed mathematical models.

Contents

Numeric and power series. Riemann integration theory. Linear algebra. Linear Programming. Financial Mathematics.

Detailed program

Numeric series: character and sum of a series; series of nonnegative terms; convergence tests; alternating series; absolute and non-absolute convergence. Power series: Taylor / Mac Laurin power series expansions.

Integration theory: Riemann integral; indefinite integral, primitives; fundamental theorem of calculus; integration methods; generalized integral. Linear algebra: Euclidean vector spaces; matrices and operations; determinant; inverse matrix; range; simultaneous linear equations; Cramer rule; Rouché/Capelli theorem; solving simultaneous linear equations; applications to economics.

Linear Programming: definition; duality theory.

Financial Mathematics: Principles of financial calculus. Simple and compound interest, trade discount. Present and

future values. Annuities and perpetuities. Amortization plans. Financial flows analysis: DCF. Investment appraisal. Bond pricing. Yields. Duration. Term structure of interest rates. Forward rates.

Prerequisites

Basic maths (Calculus)

Teaching methods

At the present state, lessons will take place in presence. Anyway, the teaching method will be modified in progress, according to the guidelines of the University, if the epidemiological conditions will require it. The teaching methods will be consistent with the University guidelines, for the lessons in the classrooms well as the tutoring in preparation for the exam.

Assessment methods

If the pandemic conditions allow the final assessment will be carried out with a face-to-face exam at the university in the following way:

A written exam, divided into two parts. In each session, one or both parts of the exam can be taken. To pass the exam, both parts of the written test must be passed during the same academic year. The two parts can be passed in any order.

Part of Mathematics: exercises and theory questions

Part of Financial Mathematics: a multiple-choice test.

The written test evaluates the formal correctness of the passages, the adequacy of the mathematical language adopted, the skills and knowledge acquired during the course.

Based on the guidelines provided by the University, the online exams will replace usual face-to-face exams and the assessment method will be adapted accordingly.

Textbooks and Reading Materials

Scovenna Marina, Scaglianti Luciano, Torriero Anna, Manuale di Matematica - Metodi e applicazioni, Editore: Cedam, 2010

S. Stefani, A. Torriero, G. Zambruno, Elementi di matematica finanziaria e cenni di programmazione lineare, Giappichelli Editore, V

Semester

First Term

Teaching language

Italian
