UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Mathematics I

2021-1-E2701Q001

Aims

The objectives of the course are the following.

Knowledge and understanding. The student will learn the main results for the theory of Calculus.

Applying knowledge and understanding. By means of several examples and exercises, the student will develop the ability of applying the theorical results presented in the lectures to specific problems.

Making judgements. The student will be able to face critically the study of function of one variable and related problems.

Communication skills. The student will become familiar with the language and formalism of Calculus, which will make him/her able to communicate with rigor and clarity the acquired knowledge.

Learning skills. The student will be able to apply the acquired knowledge to different contexts and to examine in depth some related topics by autonomous reading of books of Calculus.

Contents

Sets and functions; sequences and series; limits; derivatives; integrals.

Detailed program

- Sets and functions: rational, real, and complex numbers; polynomial and rational functions; trigonometric,

exponential, and logaritmic functions.

- Sequences: basic definitions; subsequences; limits for sequences.
- Series: basic definitions; convergence; convergence tests.
- Limits for functions: limit definitions; limit from the left and the right; uniqueness; techniques for the calculus of limits.
- Derivatives: basic definitions; derivatives of the sum, of the product, of the quotient, and of the inverse function; chain rule; Taylor formula.

- Integrals: integration by parts and with substitutions; Riemann integral; Fundamental Theorem of calculus; applications to the calculus of area and volume.

Prerequisites

Teaching form

Lessons and tutorials.

The attendance of the lessons in classroom will be subject to the instructions of the health authorities and the possibility of carrying them out under suitable safety conditions for all participants.

Textbook and teaching resource

- M. Conti, D.L. Ferrario, S. Terracini, G. Verzini: Analisi matematica, Vol I, dal calcolo all’analisi, Apogeo, 2006.

Semester

First year, first period.

Assessment method

Office hours

On appointment (via e-mail)