



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Analisi Matematica I

2021-1-E4101B001

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#### Learning objectives

#### Contents

The contents of the course can be schematically arranged in three intertwined parts:

- 1) differential calculus (first order derivative and beyond) and its applications;
- 2) differential calculus (first order derivative and beyond) and its applications;
- 3) Riemann integrability of functions and integral calculus.

#### Detailed program

Sets and functions and related terminology. Some cardinal numerals.

A peculiar set: the real number set; its fundamental metric and arithmetic properties. Upper bound of a subset of the real number set.

Scalar functions and sequences: the notion of limit and its properties; monotonicity and symmetry; the property of continuity and its relationship with the limit; infinitesimal and asymptotic behaviour.

Differential calculus for real univariate functions: first derivative, its basic properties and differentiation rules; second and further derivatives; their use in asymptotic estimates and in drawing a function graph; Taylor's formula.

Series: behaviours and convergence criteria. Main Mc Laurin's series (sin, cos, exp and log).

Integral: definite integral and anti-derivative (indefinite integral), main properties and calculation techniques.

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## **Prerequisites**

No prerequisite. A refreshment, guided in case by a tutor, is advised, which should concern the main topics typically taught at the high school.

## **Teaching methods**

Class lectures.

During the teaching period, some exercise sessions are organized.

## **Assessment methods**

## **Textbooks and Reading Materials**

M. Bramanti, C.D. Pagani, S. Salsa, *Analisi Matematica 1*, Zanichelli, Bologna, 2008

S. Salsa, A. Squellati, *Esercizi di Analisi matematica 1*, Zanichelli, Bologna, 2011

A. Guerraggio, *Matematica*, Pearson, 2014.

Some additional material, in particular anthologies of exercises and exam simulations, are provided in e-learning.

## **Semester**

First semester

## **Teaching language**

Italian

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