



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Analisi Matematica II

1920-2-E4101B009

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#### Learning objectives

The course aims at providing an introduction to the main differential and integral calculus techniques for functions of  $N$  variables.

#### Contents

Differential calculus on  $\mathbb{R}^N$ .  
Integral calculus on  $\mathbb{R}^N$ .

#### Detailed program

Differential calculus on  $\mathbb{R}^N$ .  
Partial derivatives, gradient, differentiability and tangent plane.  
Unconstrained optimization. Higher order derivatives, Taylor expansion, Hessian matrix. Convex functions.  
Implicit function theorem.  
Constrained optimization. Lagrange multipliers.

Integral calculus on  $\mathbb{R}^N$ .  
Changes of variables. Improper integrals.

#### Prerequisites

Calculus I and Linear Algebra.

## **Teaching methods**

Class lectures and tutoring activity, in the form of collective exercise sessions.

## **Assessment methods**

Written exam, consisting of practical exercises and theoretical questions. Optional oral exam, possible only if the grade of the written exam is at least 18/30. There are no midterm exams. In grading the written exam, in addition to the correctness of the results, the ability in explaining the various steps will be considered as well. The oral exam starts with a discussion of the written exam, followed by some questions regarding the topics of the course.

## **Textbooks and Reading Materials**

M. Bramanti, C. Pagani, S. Salsa, *Analisi matematica 2*, Zanichelli, 2009.

M. Bramanti, *Esercitazioni di Analisi Matematica 2*, Esculapio, 2012.

S. Salsa, A. Squellati, *Esercizi di Analisi matematica 2*, Zanichelli, 2011.

M. Boella, *Analisi Matematica 2: Esercizi*, Seconda edizione, Pearson, 2014.

Further teaching material is available at the e-learning page of the course.

## **Semester**

First semester, first cycle (from October to November).

## **Teaching language**

Italian.

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