UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Calculus II

2122-2-E4101B009

Learning objectives

The course aims to provide an introduction to the main differential and integral calculus techniques for functions of several variables.

Contents

Differential calculus on R^N.
Integral calculus on R^N.

Detailed program

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

Integral calculus on R^N.
Double and triple integrals. Normal domains in R^2 and R^3. Changes of variables.
Introduction to integration on R^n. Improper integrals.

Prerequisites

Calculus I and Linear Algebra.

Teaching methods

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

In case the COVID-19 pandemic situation persists, the lectures will be delivered through simultaneous videoconferencing. The recorded videos will be uploaded on the e-learning page of the course. The course will be completed by the tutoring activity, in the form of exercise sessions, to be delivered using the same tools employed for the lectures.

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.

During the COVID-19 pandemic, both written and oral exams will take place online, using the WebEx platform. The oral exam is compulsory when the written exam has taken place online and it is possible to give the oral exam only if the grade of the written exam is at least 14/30. At the e-learning page of the course a public link will be made available for the access to oral exams of a possible virtual audience.

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.

The first three texts are available also as eBooks.

Further teaching material can be found at the e-learning page of the course.

Semester

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

Teaching language

Italian.