UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Mathematics II

2122-1-E2701Q002

Aims

The aim of this course is to provide a second course in Mathematical Analysis with elements of Linear Algebra.

Contents

Differential and integral calculus for functions of several variables.

Detailed program

Elements of linear algebra. **Vectors and geometry in the Euclidean space. Lines and planes. Matrices. Determinant. Linear systems: Cramer's rule. Quadratic forms.**

Functions of several variables. **Limits and continuity. Partial derivatives. Differentiability, tangent planes and linear approximations. Directional derivatives and gradient. Regular curves. The chain rule. Surfaces and level curves. Taylor's formula. Maxima, minima, and saddle points. Constraints and Lagrange multipliers. The implicit function theorem.**

Integral calculus for functions of severable variables. **Jordan measure. Multiple integrals. Iterated integrals. Reduction of multiple integrals: cross section and shadow methods. Change of variables in multiple integrals.**

Vector Analysis. **Lenght of a curve and line integrals of first kind. Vector fields and line integrals of second kind. Surface area and surface integrals of first and second kind. Green's formula. Conservative vector fields. Curl. Solenoidal vector fields. Stokes and**

Gauss-Ostrogradski theorems.

Prerequisites

The course of Mathematics I

Teaching form

- Lessons, 6 credits

- Classes, 2 credits

Textbook and teaching resource

***1. Lecture notes*.**

2. James Stewart: Multivariable Calcululs.

Semester

Second semester

Assessment method

Written and oral examination. Usually the written examination consists in the solution of 6 problems: one problem of linear algebra, two problems of differential calculus, a line integral or the computation of the potential of a conservative vector field, a differential equation (or a system of differential equations). Minimum score to pass to the oral part: 15 points.
The oral examination can be performed in the same session of the written part, as well as in the subsequent session.

Office hours

By appointment.