UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Calculus II

2425-2-E4101B009

Learning objectives

The present course aims to introduce the student to the study of advanced mathematical analysis, identifying it as a useful and creative central science. At the end of the course he/she will have knowledge of differentiability and integrability for functions of several real variables. The knowledge gained will be applicable to solving problems posed by pure and applied sciences and to solving practical optimization and measurement problems.

Contents

Real-valued functions in several variables, differential and integral calculus in n dimensions

Detailed program

The program will be divided into the following modules.

1. Recalls of linear algebra
2. Functions of several variables (examples),
3. Preimages, graphs, level spaces
4. Topology of R^n
5. Sequences and continuity
6. Derivability and differentiability
7. Differentiability of vector-valued functions
8. Higher order derivatives
9. Extremal points: maxima and minima
10. Constrained maxima and minima

11. Integral calculus (double and triple integrals)
12. Integral calculus in R^n
13. Integral calculus of vector functions (time permitting)

Prerequisites

Linear algebra and calculus in one real variable

Teaching methods

Classroom lectures. Lectures are always supplemented with examples and counterexamples related to the fundamental concepts explained. In addition, numerous exercises are carried out. Students will be given exercise sheets on which to practice to learn the concepts explained the classes.

Assessment methods

Written examination. There will be 3 questions and 3/4 exercises to solve.

Textbooks and Reading Materials

Textbooks

1. **Analisi Matematica 2** by *Bramanti-Pagani-Salsa*
2. **Esercizi di Analisi Matematica 2** by *Salsa-Squellati*

Additional reference: **Lezioni di Analisi Matematica 2 (prima parte)** by *Lanconelli*

Semester

From September 23rd to November 6th of 2024

Teaching language

Italian

Sustainable Development Goals