UNICUSANO
ROME

Code: Mat/05 **Credits: 6**
Matter: Calculus 2
Main language of instruction: Italian
Other language of instruction: English

Teaching Staff

Head instructor
Dr. Valerio Marchisio - valerio.marchisio@unicusano.it

Introduction

1. *Objective of the course:*

The goals of the course "Calculus 2" are to learn how to deal with function of several variables, to find their maximum and minimum, to learn curves and surfaces in n dimensions, to solve the basic ordinary differential equations, either from a theoretical point of view, either from a practice point of view.

Objectives

2. *Course Structure:*

The course is organized in the following subjects: topology in n dimensions, maxima and minima of function of several variables, constrained maxima and minima of function of several variables, curves and line integrals, vector fields, ordinary differential equations, integrals in n dimensions, series of functions.

Competencies:

The competencies for this course are:

- Functions of one variable
- Differential calculus for function of one variable
- Study of a function of functions of one variable
- One-dimensional integrals

Syllabus

3. *Programme of the course:*

Subject 1. Function of several variables: topology, limits and continuity, Weirstrass' theorem
Subject 2. Maxima and minima for function of several variables: derivatives, tangent plane, Schwarz's theorem, maxima and minima (also constrained), Lagrange multipliers
Subject 3. Curves and vector fields: curves and their properties, line integrals, vector fields, conservative vector fields
Subject 4. Ordinary differential equations: properties of ordinary differential equations, linear equations, separable equations, other non-linear equations, Cauchy problem
Subject 5. Integrals: Riemann integral, multiple integrals for functions of two or three variables, surfaces and surface integrals.
Subject 6. Series of functions: power series, essentials of Fourier series

Evaluation system and criteria

The assessment of course is based on a final written exam.

Bibliography and resources

4. *Materials to consult:*

Lecture notes.

5. *Recommended bibliography:*

Schaum's Outline of Calculus, 6th Edition, Frank Ayres and Elliott, Mendelson, McGraw Hill 2013

Schaum's 3,000 Solved Problems in Calculus, Elliott Mendelson, McGrawHill Education 2009.