UNIVERSITÀ DI PISA

MATHEMATICAL ANALYSIS I

LUIGI CARLO BERSELLI

Anno accademico	2022/23
CdS	COMPUTER ENGINEERING
Codice	004AA
CFU	12

Moduli	Settore/i	Tipo	Ore	Docente/i
ANALISI MATEMATICA I	MAT/05	LEZIONI	120	LUIGI CARLO BERSELLI

Learning outcomes

Knowledge

Students who successfully complete the course will demonstrate undergraduate-level skills in the major fields of mathematical analysis. Students will construct clearly written proofs using correct terminology, citing foundational theorems, and employing induction and contradiction, and demonstrate ability to determine the validity of proofs. Students will demonstrate ability to collect useful information concerning mathematical problems and organize it systematically, make reasonable conjectures, develop fruitful approaches toward problem solutions, and reach logical conclusions. Students will demonstrate, by oral and written presentation of mathematical topics, the skills of introducing principal concepts, using an organized structure and appropriate style and employing correct symbols and terminology.
Students who successfully complete the course will demonstrate undergraduate-level skills in the major fields of mathematics. Students will construct clearly written proofs using correct terminology, citing foundational theorems, and employing induction and contradiction, and demonstrate ability to determine the validity of proofs. Students will demonstrate ability to collect useful information concerning mathematical problems and organize it systematically, make reasonable conjectures, develop fruitful approaches toward problem solutions, and reach logical conclusions. Students will demonstrate, by oral and written presentation of mathematical topics, the skills of introducing principal concepts, using an organized structure and appropriate style and employing correct symbols and terminology.

Assessment criteria of knowledge

- In the written final exam the student must demonstrate his/her knowledge of the course material and organise an effective and correctly written reply;
- During the oral exam the student must be able to demonstrate his/her knowledge of the course material and discuss the reading matter thoughtfully and with propriety of expression.

Methods:

- Final oral exam;
- Final written exam.

Skills

At the end of the class:

- student will be able to solve problems of real analysis, for function of one variable, with applications to simple practical problems;
- students will be able to formulate and solve problems of maximum and minimum and elementary mathematical modeling;
- students will be able to present in a rigorous and logically correct way results obtained.

Assessment criteria of skills

- during the lectures will be solved problems which are daily proposed during the lectures of the previous days, with open discussion;
- There will be two written test of self-evaluation (not valid for the final exam which will be only at the end of the class).

Behaviors

- Student could get acquainted with modeling and solution also of problems of applied mathematics, with techniques of differential and integral calculus.

UNIVERSITÀ DI PISA

Assessment criteria of behaviors

- During class hours solutions to proposed problems will be given and students can collaborate in their solution exposure;
- Some class hours will be devoted to the indiviudual and group analysis of problems.

Prerequisites

The requested knowledge concerns the elementary algebra and trigonometry, the exponential and logarithmic functions; The solution of basic algebraic, trigonometric and trascendent (exponential) equations and inequalities.

Teaching methods

Delivery: face to face.
Attendance: Advised.
Learning activities:

- attending lectures;
- individual study;
- ICT assisted study;

Teaching methods:

- Lectures;
- Task-based learning/problem-based learning/inquiry-based learning;

Syllabus

The course covers fundamentals of mathematical analysis for functions of one real variable. The main contents concerns limits, convergence of sequences and series, continuity, differentiability, integral calculus, and ordinary differential equations.

Bibliography

Due to the standard tiplogy of the topics, recommended reading includes any textbook of Analysis I; further bibliography, which can change from year to year, will be indicated during the lessons.
For the current year a suggested textbook is "Analisi Matematica 1", by Pagani and Salsa, ed. Zanichelli

Assessment methods

To attend the exam it is compulsory not to have any educational debt (OFA)

Updated: 18/08/2022 10:16