COURSE DESCRIPTION
CALCULUS 1

SSD: ANALISI MATEMATICA (MAT/05)

DEGREE PROGRAMME: ARCHITETTURA (N14)
ACADEMIC YEAR 2022/2023

COURSE DESCRIPTION

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GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: 01281 - ANALISI MATEMATICA I E GEOMETRIA
MODULE: 12980 - ANALISI MATEMATICA 1
SSD OF THE MODULE:
CHANNEL: 02 Cognome A - Z
YEAR OF THE DEGREE PROGRAMME: I
PERIOD IN WHICH THE COURSE IS DELIVERED: SEMESTER I
CFU: 8

REQUIRED PRELIMINARY COURSES

No one

PREREQUISITES

Good knowledge of mathematics as scheduled in programs of all upper secondary schools

LEARNING GOALS

The main objective of the course is the acquisition, by the student, of the logical-mathematical skills necessary to face future professional problems. From the point of view of contents, the course aims to provide the mathematical foundations necessary for the study of the scientific subjects of the master's degree course in architecture and their applications. The acquired training must allow students to be able to perform simple calculations, to be able to solve simple equations, inequalities, linear systems; to be able to carry out the study of real functions of a real variable and, finally, to be able to solve geometric questions potentially useful for the development of design skills.

The course represents a module of Calculus 1 and Geometry course, which in fact consists of the following modules:
1. Calculus 1 (MAT / 05 - 8 CFU);
2. Geometry (MAT / 03 - 3 CFU).

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must show knowledge and understanding of basic elements of Mathematics and the mathematical language. The educational path of the course aims to provide students with the knowledge and basic methodological tools necessary for strengthening logical, inductive and deductive reasoning skills.

Applying knowledge and understanding

The student will have to show that he is able to use mathematical tools for the formalization of problems and the construction of simple mathematical models. The student must acquire the operational skills necessary to apply the study of the real functions of a real variable, the methods of solving equations, inequalities and linear systems and the knowledge of vectors and matrices both to theoretical-practical questions and to applicative problems of geometric nature.

COURSE CONTENT/SYLLABUS

NUMBERS AND CARTESIAN PLANE: Sets - Natural, integer, rational, real numbers - Maximum, minimum, least upper bound, greatest lower bound - Coordinate axes - Geometric loci - Exercises.
REAL FUNCTIONS OF ONE REAL VARIABLE: Functions and Cartesian representation - Invertible functions - Monotonic functions - Elementary functions - Equations and inequations- Exercises.
LIMITS AND CONTINUITY: Definitions, examples and properties of limits of functions - Continuous functions and related theorems - Exercises.
DIFFERENTIAL CALCULUS: Definitions, examples and properties of derivable functions - Derivatives of the elementary functions - Applications of the differential calculus - Exercises.
INTEGRALS: Primitive functions - Indefinite integrals - Definite integrals - Fundamental theorem of Calculus - Exercises.

READINGS/BIBLIOGRAPHY

G. Crasta, A. Malusa, Elementi di Analisi Matematica e Geometria con prerequisiti ed esercizi svolti, Edizioni LaDotta.

TEACHING METHODS OF THE COURSE (OR MODULE)

The teacher will use lectures for about 70% of the total hours and exercises, to deepen theoretical aspects, for about 30% of the total hours.

EXAMINATION/EVALUATION CRITERIA

a) Exam type

- [x] Written
- [x] Oral
- [ ] Project discussion
- [x] Other : The final grade can take into account of intermediate classwork given during the lessons, in order to stimulate the active participation of the students.

In case of a written exam, questions refer to

- [x] Multiple choice answers
- [x] Open answers
- [x] Numerical exercises

b) Evaluation pattern

The final grade will take into account of the correctness of the answers given in the written exams and/or in the intermediate classwork. In oral exams, the final grade will take into account of the knowledge of the definitions, of the theorems and of the proofs shown during the lessons, of the acquired property of language, of the capacity to write correctly formulas and statements of theorems through mathematical symbols and, finally, of the capacity to discuss about notions explained during the lessons.