



PROGRAMMING 1

Enrollment year	2020/2021
Academic year	2020/2021
Regulations	DM270
Academic discipline	INF/01 (COMPUTER SCIENCE)
Department	DEPARTMENT OF MATHEMATICS "FELICE CASORATI"
Course	MATHEMATICS
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (01/10/2020 - 20/01/2021)
ECTS	6
Lesson hours	56 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	GUALANDI STEFANO (titolare) - 6 ECTS
Prerequisites	Basic understanding of how computers work.
Learning outcomes	<p>At the end of the course the student will be able to focus the connection between mathematics and automatic computation. The student will be taught</p> <p>the python programming language, along with the fundamental idea of algorithms and data structure implementations</p>
Course contents	<p>Introduction to automated computing, representation of the numbers in floating points precisions, error propagations in floating point operations. Presentation of the development environment for Python:</p> <ul style="list-style-type: none">- General purpose commands- Variables, list, and built-ins functions- Expressions and logical operators- Control flow: if-then-else- Reading and writing of CSV files

- Introduction to functional programming
- Numerical series and graphical representations
- Imperative programming vs. functional programming
- Solution of basic optimization problems (knapsack, shortest path, traveling salesman problem)

Teaching methods

Lessons and laboratories with the computer

Reccomended or required readings

Lecture notes available on the web page of the course.

Recommended additional textbook:

- Introduction to Computation and Programming Using Python - With Application to Understanding Data, by John V. Guttag. MIT Press (second edition)

Assessment methods

Implementation of programs with the computer (live coding)

Further information**Sustainable development goals - Agenda 2030**

[\\$lbl legenda sviluppo sostenibile](#)