UNIVERSITÀ degli STUDI di CATANIA

**DEPARTMENT OF DRUG SCIENCES**
**Bachelor's Degree in Applied Pharmaceutical Sciences**
Academic Year 2019/2020 - 1° Year

# MATEMATICA E STATISTICA - INFORMATICA M - Z

12 CFU - 1° and 2° Semester

**Teaching Staff**

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## LEARNING OBJECTIVES

- **Mathematics and Statistics**
  The course aims to introduce the student to the basic concepts of the theory of functions of a real variable, with elements of analytical geometry. The student must be able to apply methods and basic concepts of probability and statistics to data analysis.

- **Basic and Applied Computer Science**
  At the end of the course, the student will acquire information theory basic concepts and programming and reasoning systems global knowledge; He will know the computer networks and he will be able to identify related issues. Finally, he will own a global vision of the hypertext markup language (HTML) useful to develop and design a simple WEB site.

## COURSE STRUCTURE

- **Mathematics and Statistics**
  The course will take place through lectures with exercises

- **Basic and Applied Computer Science**
  Through lessons and practical sessions at the end of each learning unit (when planned).

## DETAILED COURSE CONTENT

- **Mathematics and Statistics**
  Basic concepts of set theory (union, intersection, function, injective and surjective function, composition of functions and invertible functions). Rational and real numbers. Numerical sets, extremes and intervals. Real functions of real variable and their Cartesian representation. Equation of the line, parallelism, perpendicularity. Recall of trigonometric functions, powers, exponentials, logarithms. Limit of a function, continuity, derivability, differentiability and regularity of a higher order. Composite and inverse functions. Crescence and convexity. Determination of extremes. Integration according to Riemann and determination of primitives.
  Fundamental concepts of statistics and probability theory. Distribution and density of probability, mean, variance and joint and conditional probability. Some significant discrete and continuous distributions. Estimate of statistical parameters. Linear regression.

- **Basic and Applied Computer Science**
  Section 1.

  Information theory basic concepts; Hardware, Software; Information technology; Computers types; PC components; Computer performances. Hardware: CPU; Memory; I/O peripherals; Memory devices. Software: applications, operating systems; Graphical User Interface; System development.

  Section 2.

  Computer networks: LAN, WAN; Intranet, extranet; Internet; PSTN line; Net applications; Digital world: e-mail, e-commerce. WEB; Basic concepts of Computer Network Security.

  Section 3.

  Introduction and definition of WEB; URI; HTML definition; Fundamental concepts; W3C consortium; Structure of a HTML document; TAG elements; Inline elements and block levels; Text Tag; Paragraphs; Colors and Fonts; Lists (ordered and not ordered); Links; Sounds and images; Tables; Cascading Style Sheets (CSS).

## TEXTBOOK INFORMATION

- **Mathematics and Statistics**
  [T] Teacher's notes

  [MS] Marcellini-Sbordone: Elementi di Analisi Matematica I

  [G] Statistica, Lezioni ed esercizi, M.Garetto, freely available
  http://www.dm.unito.it/quadernididattici/garetto/quaderno_statistica.pdf

- **Basic and Applied Computer Science**
  Teacher's notes