UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

# COURSE SYLLABUS

## Propaedeutic Sciences

**2122-1-I0302D001**

### Aims

Student should know the general principles of Medical Statistics, Mathematics, General Physics, Physics of Radiationsand Electronics, necessary to carry on their profession.

### Contents

The general aims of the course are to provide students with basic knowledge of Medical Statistics, Mathematics, Applied Physics and Electronics.

### Detailed program

MEDICAL STATISTICS: Types of variables. Tables and graphs. Indices of position and dispersion. Measurement errors: precision and accuracy. Probability: conditional probability independence, probability of the union and intersection of events. Random variables and probability distributions: Binomial and Gaussian. Correlation and regression.

MATHEMATICS FOR PHYSICS: Basic algebra. Power, exponential and logarithmic functions. Exponential and logarithmic functions. Complex numbers. Combinatory calculus.

APPLIED PHYSICS: Unit of measurement and changes of the unit of measurement. Vector and scalar quantities. Operations with vectors and vector properties. Concept of force, moment of a force. Equilibrium of a rigid body, examples of the equilibrium of the human body. The levers and their application. Elements of geometrical optics. Electromagnetic waves and electromagnetic radiation spectrum. Elements of Physical optics: absorption and scattering of light. Beer-Lambert law. The atomic nucleus structure. Radioactivity. Law of radioactive decay.

Radiation-matter interaction.

BASIC ELECTRONICS: Electrical quantities. Steady state electrical circuits. Electrical circuits with resistors. Capacitors, steady state and transient electrical circuits. Alternated current electrical circuits and electrical impedance. Ideal transformer. Measurements of electrical quantities. Physics of semiconductors. Principal junction-devices with their principal applications. OP-AMP and applications. Elementary logic circuits. Electronic measurement chain. Electronic noise.

## Prerequisites

---

## Teaching form

Lectures

## Textbook and teaching resource

Medical statistics: Fowler J., Jarvis P., Chevannes M., Statistica per le professioni sanitarie, 2006 Edises

## Semester

First Semester

## Assessment method

The final mark, based on the average score obtained by the students during the different evaluations, is set during an oral interview with the student, during which the written tests are scrolled to check mistakes.

## Office hours

By appointment required by mail