GENERAL PHYSICS

FIS/02 - 8 CFU - 1° Semester

Teaching Staff

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LEARNING OBJECTIVES

Understanding the mechanisms of the scientific method and the main physical laws of mechanics, thermodynamics and electromagnetism. Ability to perform simple exercises on the topics of the program.

With reference to the Dublin Descriptors, this course contributes to acquiring the following transversal skills:

Knowledge and understanding:

- Inductive and deductive reasoning skills.
- Ability to schematize a natural phenomenon in terms of scalar and vector physical quantities.
- Ability to set up a problem using appropriate relationships between physical quantities (algebraic, integral or differential) and to solve it with analytical or numerical methods.
- Ability to perform statistical analysis of data.

Ability to apply knowledge:

- Ability to apply the acquired knowledge for the description of physical phenomena using rigorously the scientific method.
- Ability to design simple experiments and perform the analysis of experimental data obtained in all areas of interest of physics, including those with technological implications.

Autonomy of judgment:

- Critical reasoning skills.
- Ability to identify the most appropriate methods to critically analyze, interpret and process experimental data.
- Ability to identify the predictions of a theory or model.

Communication skills:

- Good skills in tools for the management of scientific information and for data processing and bibliographic research.
- Ability to present orally, with properties of language and terminological rigor, a scientific topic, illustrating its motivations and results.

Learning ability:

- Ability to know how to update their knowledge through the reading of scientific publications, in Italian or English, in the various fields of physical disciplines, even if not specifically studied during their training.

COURSE STRUCTURE

Frontal lectures - Audiovisual material

Should the circumstances require online or blended teaching, appropriate modifications to what is hereby stated may be introduced, in order to achieve the main objectives of the course.

Exams may take place online, depending on circumstances.

DETAILED COURSE CONTENT

Fundamental physical quantities and units. Kinematics in one and two dimensions. Laws of Dynamics. Gravitation. Conservation of energy and momentum. Friction forces. Harmonic oscillator. Statics and dynamics of fluids. Calorimetry and Thermodynamics. Electrostatics and electrodynamics. Magnetism and electromagnetism.

TEXTBOOK INFORMATION

1) D.C.Giancoli, “Fisica”, Ed.Ambrosiana, Milano

2) A.Giambattista, "Fisica Generale. Principi e applicazioni" (terza ed.), McGrawHill

3) G.Bellia, "Fisica per un anno. 21 spunti di conoscenza", Idelson Gnocchi

4) D.Halliday, R.Resnick, J.Walker, “Fondamenti di Fisica” (sesta ed.), Ed.Ambrosiana, Milano

5) P.J.Nolan, “Fondamenti di Fisica”, Ed.Zanichelli, Bologna

6) A.Pluchino, "La firma della complessità. Una passeggiata al margine del caos", Malcor D' Edizione 2015
