



## PHYSICS A - L

FIS/07 - 9 CFU - 2° Semester

### Teaching Staff

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### LEARNING OBJECTIVES

Knowledge of the basic physics concepts and ability to use them for problem solving.

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### DETAILED COURSE CONTENT

Physical quantities and units of measure. Vectors and vector operations.

Cinematics: description of movements, position, velocity, acceleration; uniform linear motion; uniformly accelerated motion, circular motion, harmonic motion.

Dynamics: force and the laws of dynamics, Gravity, friction, viscous friction and sedimentation, centrifugal force and centrifugation.

Energy and work: definition of work; kinetic energy; conservative forces and potential energy. Conservation of total energy.

Statics of fluids. Pressure, principle of Pascal; Stevin's law, principle of Archimede; measurement of pressure and the sphygmomanometer; surface tension, Laplace law, capillarity and Jurin's law, gaseous embolus.

Ideal fluid dynamics, principle of continuity, Bernoulli's theorem, aneurism and stenosis, laminar and turbulent flows, viscosity, hydrodynamics of the cardiovascular system.

Gas state: ideal gases law, equation of state of the ideal gases, kinetic theory of gases, real gases and van der Waals equation of state, vapour tension, Andrew's diagram of state.

Thermology: temperature and heat, specific heat, internal energy and first principle of thermodynamics, thermodynamics transformations, change of state and latent heat, propagation of heat, thermoregulation of the human body.

Electromagnetism: electric charge and the Coulomb force, electric field and electric potential, capacitors, electric current, resistance and Ohm's law, simple circuits, electrolytic conductors, electroforesis, magnetic fields and electric current, Lorentz force, mass spectrometer.

Wave phenomena: characteristics of waves, propagation, interference, standing waves, refraction and diffraction, Characteristics of sound waves, the human ear., Doppler effect, ultrasounds and ecography. Electromagnetic waves and light.

Geometrical optics: ray model, reflection and refraction laws. Lenses and the formation of images. The human eye and its defects.

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## **TEXTBOOK INFORMATION**

F. Borsa e A. Lascialfari, "Principi di Fisica", EdiSES

Giancoli, "Fisica", Casa Editrice Ambrosiana

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