UNIVERSITÀ degli STUDI di CATANIA

DEPARTMENT OF CHEMICAL SCIENCES
Bachelor's Degree in Chemistry
Academic Year 2015/2016 - 1° Year

PHYSICS I

FIS/01 - 6 CFU - 2° Semester

Teaching Staff

ROSSELLA CARUSO

Email: rossella.caruso@ct.infn.it
Office: stanza N.316 - III piano - Dipartimento di Fisica e Astronomia - Cittadella Universitaria - Via Santa Sofia, 64-95123 CATANIA
Phone: 095 3785402
Office Hours: giovedì - 15.30-18.30

DETAILED COURSE CONTENT

INTRODUCTION: scientific method, physical quantities and units of measurement

VECTORS: scalar and vectorial quantities; calculus with vectors

KINEMATICS OF A PARTICLE: frame of reference; law of motion, trajectory, velocity, acceleration; rectilinear motion; free fall of body; projectile motion; circular motion

DYNAMICS OF A PARTICLE: fundamental principles: Newton’s laws; inertial and gravitational mass; forces: force of gravity, normal and friction force, tension, elastic force, air resistance; the simple gravity pendulum; moment of a force; linear momentum and angular momentum of a particle; work; kinetic energy; potential energy; total energy and its conservation

OSCILLATIONS: simple harmonic oscillator; damped oscillator; driven oscillator

UNIVERSAL GRAVITATION: Kepler’s laws of planetary motion; law of universal gravitation; energy in a gravitational field

DYNAMICS OF MANY PARTICLES AND RIGID BODIES: center of mass; theorems of the center of mass; density of a material; Konig’s theorems, moment of inertia; Huygens-Steiner’s theorem; motion of rigid bodies: translation and rotation; the compound pendulum

HYDROSTATICS AND HYDRODYNAMICS: pressure; Stevino’s law; the experiment of Torricelli; Pascal’s principle; Archimede’s principle; Bernoulli’s theorem

EXERCISES on the above topics