UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

PHYSICS - PART 1 (SURNAMES A-K)

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	FIS/01 ()
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOLOGICAL SCIENCES
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	
Teacher	MACCHIAVELLO CHIARA - 6 ECTS
Prerequisites	The exam can be accessed only by the students who passed the exam in Maths.
Learning outcomes	Learning of the basic concepts of classical physics.
Course contents	Physical quantities and their measurement. Mechanics. Kinematics of a particle. Newton’s laws. Conservation of momentum. Rectilinear motion: constant velocity and constant acceleration. Sedimentation. Centrifugation. Simple harmonic motion. Kinetic energy and work-kinetic energy theorem. Potential energy and conservation of mechanical energy. Mechanics of fluids.

	Equilibrium of a fluid: Pascal’s principle, hydrostatic pressure, Archimedes’ principle. Surface tension and capillarity. Bernoulli’s equation and its applications. Laminar flow and turbulent flow: viscosity, Poiseuille law. Blood flow. Thermodynamics. Ideal gases. Work in thermodynamics. Heat and temperature. First law of thermodynamics. Heat capacity and specific heat capacity. Phase transitions and latent heats. Diffusion: Fick’s first law. Osmosis: Van’t Hoff’s laws. Second law of thermodynamics and entropy. Acoustics and optics. Law of propagation of elastic waves. Characteristics of sound. Doppler effect. Laws of reflection and refraction. Spherical refracting surface. Thin lenses. Simple and compound microscope and their magnification. Field depth and resolving power of the microscope. Visual acuity. Convergence defects. Electricity and magnetism. Electric charge. Electric field. Electric capacity. Direct current. Ohm’s law. Thermal effect of current. Electrolytic conductors. Electrolysis: Faraday’s laws. Electrophoresis. Magnetic effect of current. Electromagnetic induction.
Teaching methods	The course is based on front lectures based on PowerPoint presentations, with possible integrations by means of a blackboard. During the fronte lectures simple examples of probems will be proposed. The course is completed by seminal and tutorial activities, that aim at giving methods of problem solving in view of the final exam.
Reccomended or required readings	F. Borsa, A. Lascialfari, Principi di Fisica, EdiSES Other suggested textbooks: F. Borsa, S. Altieri, Lezioni di Fisica con Laboratorio, La Goliardica Pavese J.S. Walker, Fondamenti di Fisica, Pearson D.C. Giancoli, Fisica, C.E.A. D. Halliday, R. Resnick, J. Walker, Fondamenti di Fisica, C.E.A.
Assessment methods	The exam consists in a written form. The written exam is composed of two parts. The first is based on the solution of some problems, similar to the examples proposed during the lectures and the tutorial activities. The second part is composed of open questions on topics addressed during the lectures.
Further information	
Sustainable development goals - Agenda 2030	The goals