University POLITEHNICA of Bucharest

Faculty of Industrial Engineering & Robotics

Study programme: Industrial Engineering

Form of study: Bachelor

COURSE SPECIFICATION

Course title	General Physiscs	Semester	2
Course code	UPB.06.F.02.O.003	ECTS	5

Course structure	Lecture	Seminar	Laboratory	Project	Total hours
No. of hours/ week	2		2		4
No. of hours/ semester	28		28		56

Lecturer	Lecture	Seminar	Laboratory	Project
Name, academic degree	Cristian Toma (Assoc.Prof.)			Cristian Toma (Assoc. Prof.)
Contact (E-mail, location)	cristian.toma@physics.pub.ro			cristian.toma@Physics.pub.ro

Course description (max: 200 words) Object of physics. Fundamental interactions. State laws, process laws, models and approximations, axioms; basic interactions; international system of units (basic units, derived units) Thermodynamics postulates. Thermodynamic principles. Applications of thermodynamics principles to the study of ideal and real gases. Characteristic functions (enthalpy, free energy, free enthalpy). Statistical mechanics concepts. Statistical distributions. Kinetic-molecular theory. MaxwellBoltzmann distribution. Statistical interpretation of entropy. Fluctuations. Electrostatic field; fundamental notions. Electrical current: conductors, isolators, semiconductors; continuity equation. Laws of the electromagnetic field (Maxwell's equations). Electric and magnetic fields energy Propagation of Electromagnetic waves in vacuum; reflection and refraction of electromagnetic waves in dielectric media.

Seminar description (max: 200 words)

Laboratory description (max. 200 words) Statistical methods for experimental data; Determination of refractive index by Chaulnes method Study of light dispersion - prism spectroscope; Light interference - Young device Study of Fresnel diffraction; Diffraction grating Hall effect; Photoelectric effect Temperature dependence of semiconductor electrical conductivity; Curie law of magnetization

Project decsription (max. 200 words)

Assessment methods	Percentage of the final grade	Minimal requirements for award of credits
Written exam	**40%**	final evaluation 40% (for mark 5 some basic applications should be solved, for mark 10 the selection of an adequate set of equations for a new environment is required).
Written paper	**20%**	for mark 5 some basic applications should be solved, for mark 10 the selection of an adequate set of equations for a new environment is required
Homework	**10%**	for mark 5 some basic applications basic aspects should be presented, for mark 10 the advantages of certain modelling methods should be presented
Laboratory	**30%**	laboratory attendance and correct determination of required physical quantities 70%, understanding of causal aspects 30% (for mark 5 the basic set of measurements should be performed and the experimental data should be analyzed by statistics/ graphics methods, for mark 10 the causal aspects should be understand)

References
1. R. Feynman, Modern Physics (Vol.1-3) **2.** Berkeley Physics (Vol. 1-5)

Prerequisites	Co-requisites (courses to be taken in parallel as a condition for enrolment)
Calculus	

Additional relevant information:

Date: 15 May 2022