POLITEHNICA University of Bucharest (**UPB**)
Faculty of Engineering and Management of Technological Systems (**IMST**)
Study Programme: Industrial Engineering (**IE**)
Form of study: Licence (Bachelor)

COURSE SPECIFICATION

Course title:	GENERAL PHYSICS	***Semester:***	2
Course code:	UPB.06.F.02.O.003	***Credits (ECTS):***	5

Course structure	Lecture	Seminar	Laboratory	Project	Total hours
Number of hours per week	2		2		4
Number of hours per semester	28		28		56

Lecturer	Lecture	Seminar / Laboratory / Project
Name, academic degree	Cristian Toma (Assoc. Prof.)	Anca Popovici (Lecturer)
Contact (email, location)	cgtoma@physics.pub.r BN131	popovici@physics.pub.ro BN030

Course description:

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. Maxwell-Boltzmann 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 / Laboratory / Project description:

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

Intended learning outcomes:

Create the abilities for experimental data processing, create the abilities to perform physics experiments, thorough understanding of the physics notions introduced in the physics course and

of the experimental and modern measurement methods Perform computations, proves and applications for solving industrial engineering specific tasks based on knowledge of fundamental sciences. The association of knowledge, principles and methods of the technical sciences in the field with graphical representations for solving specific tasks.

Assessment method:	% 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).
Report / project		
Homework		
Laboratory	25 %	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)
Other	35%	course presence and activity ; 20%, written paper 15%

References:	
R. Feynman, Modern Physics (Vol.1-3) Berkeley Physics (Vol. 1-5)	
Prerequisites:	***Co-requisites*** ***(courses to be taken in parallel as a condition for enrolment):***
Calculus	
Additional relevant information:	

Date: July 2016
Professional degree, Surname, Name:
Associated Professor Cristian Toma