Title	Code
Physics	**1010101211010410321**
Field: **Environmental Engineering First-cycle Studies**	Year / Semester: **1 / 1**
Specialty: **-**	Course: **core**
Hours: Lectures: **3** Classes: **1** Laboratory: **1** Projects / seminars: **-**	Number of credits: **6**
	Language: **polish**

Lecturer:

Professor Grazyna Bialek-Bylka
Institute of Physics
60-956,Poznan,Nieszawska str.13A phone: +48 (61) 665 3185
e-mail: bialek@phys.put.poznan.pl

Faculty:

Faculty of Civil and Environmental Engineering
ul. Piotrowo 5
60-965 Poznań
tel. (061) 665-2413, fax. (061) 665-2444
e-mail: office_dceeaf@put.poznan.pl

Status of the course in the study program:

general course.

Assumptions and objectives of the course:

General physics course is good background for other coursess and the logical presentation and understanding technical problems.

Contents of the course (course description):

Mechanics: kinetics and dynamics, the law of conservation of energy, gravitational potential energy and escape velocity, power, stable and unstable equilibrium, linear momentum and collisions (momentum and its relation to force, conservation of momentum, elastic and inelastic collisions, center of mass), rotational motion (rotational dynamics, angular momentum and its conservation, rotational kinetics energy). Thermodynamics. Electricity: electric charge & charge conservation, insulators and conductors, Coulomb's law, the electric field (point charge, dipole), motion of a charge particle in an electric field, Gauss' law and its application, electric potential, capacitance and resistance, circuits. Wave and quantum optics: wave nature of light and wave-matter interactions (reflection and refraction, interference, diffraction, polarization), photon theory of light and the photoelectric effect, Compton effect, wave-particle duality, wave nature of matter and de Broglie?a hypothesis, laser. Solid state physics: the electric and magnetic properties of solids, insulators, metals and semiconductors, the light-emitting diode and transistor. Nuclear physics and astrophysics: nuclear models, physical properties of the atomic nuclei, nuclear physics application, biological effects of radiation, nuclear fission and fusion, particle physics and cosmology, interactions of elementary particles. Quantum mechanics and theory of relativity: Schrödinger equation, Heisenberg's uncertainty principle, the Michelson-Morley experiment, relativity of time intervals and length (time dilatation and the twin paradox, length contraction), Newtonian mechanics and relativity Galilean and Lorentz transformations, relativistic mass, energy and mass.

Introductory courses and the required pre-knowledge:

Basic knowledge of Secondary School levels of mathematics and physics.

Courses form and teaching methods:

Lectures supported by transparencies and films.

Form and terms of complete the course - requirements and assessment methods:

Current tests at Auditory Classe and final examination

Basic Bibliography:

1. . D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics J. Wiley & Sons, Inc New York, Chichester, Brisbane, Toronto & Singapore, 1997
2. D.C. Giancoli, Physics for Scientists & Engineers Prentice Hall, Upper Saddle River, New Jersey 2000

Additional Bibliography: