FACULTY OF COMPUTER SCIENCE AND MANAGEMENT
SUBJECT CARD
Name in Polish   Fizyka I
Name in Englis   Physics I
Main field of study (if applicable): Computer Science
Specialization (if applicable): ……………………..
Level and form of studies: 1st/ 2nd* level, full-time / part-time*
Kind of subject: obligatory
Subject code FZP008009
Group of courses NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	15			
Number of hours of total student workload (CNPS)	90	60			
Form of crediting	Examination	Crediting with grade			
For group of courses mark (X) final course					
Number of ECTS points	3	2			
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes					

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES
1.   Mathematical analysis I
2.   Algebra I
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SUBJECT OBJECTIVES
C1 Familiarizing of students with current state of knowledge in the field of general physics
C2 Achievement by students of satisfactory level of orientation and knowledge in chosen fields of modern physics on the basis of clearly formulated assumptions and background of classical physics

SUBJECT EDUCATIONAL EFFECTS
relating to knowledge:
PEK_W01Recognition of the structure of classical mechanics of material point and of the
         material point systems
PEK_W02 Recognition of relativistic mechanics in the framework of special theory of
         relativity including some elements of general theory of relativity
PEK_W03 Recognition of phenomenological thermodynamics of complex systems
PEK_W04 Recognition of general formulation of Maxwell electrodynamics
PEK_W05 Introduction level of recognition in quantum physics
relating to skills:
PEK_U01 Skill and experience in formulation of opinions on classical physics in general terms

PEK_U02 Ability to identify mutual connections between various fields of classical physics,
ability to continuation of studies and literature recognition
relating to social competences:
PEK_K01 Ability to differentiate between the general formulation and particular exercises

PEK_K02 Ability to identify applications of physics in other fields of science and technology

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours**
Lec 1	Description of the aim and the methods of physics, reference frames – kinematics – cylindrical, spherical and normal coordinate systems	2
Lec 2	Newton rules of dynamics, determinism of classical physics, examples, harmonic oscillator -- free, damped and forced	2
Lec 3	Conservation rules for momentum, angular momentum and energy for the material point, condition for potential fields, central field, potential of gravitation field, gauge of the potential	2
Lec 4	Angular momentum of rigid body; tensor of inertia	2
Lec 5	Special theory of relativity – Lorentz transformation, momentum and kinetic energy in relativity theory, elements of general relativity, curvature of space-time, principle of equivalence, Mössbauer effect	2
Lec 6	Phenomenological thermodynamics – functions of state, system parameters, state equation, rules of thermodynamics	2
Lec 7	Simple thermodynamical identities, applications	2
Lec 8	Maxwell formulation of electrodynamics	2
Lec 9	Static and dynamical effects in electrodynamics	2
Lec 10	Light, Fermat rule, diffraction, assumption of quantum description	2
Lec 11	Foundations of quantum mechanics, wave function, operators of observables, quantum measurement	2
Lec 12	Simple example of quantum systems, free particle, wells	2
Lec 13	Band structure of crystals, macroscopic quantum effects (superconductivity)	2
Lec 14	Bosons and fermions, elementary particles	2
Lec 15	Introduction notices on quantum information processing, quantum computer, teleportation	2
	Total hours	30

Form of classes - class		Number of hours
Cl 1	Reference frames – kinematics – examples	2
Cl 2	Motion equation – constant force, osciillators, friction	2
Cl 3	Conservation rules and potential forces -- examples	2
Cl 4	Dynamics of rigid body – examples, wave motion, Doppler effect, sound	2
Cl 5	Special relativity – examples	2
Cl 6	Thermodynamics of gases – ideal gas	2
Cl 7	Simple illustrations of electrodynamical effects	3
	Total hours	15

TEACHING TOOLS USED
N1. Standard classical lecture
N2. Demonstrations of experiments
N3. Traditional classes and practical laboratory exercises
N4. Script to lectures
N5. Additional consultations for interested students

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_W01	Test
F2	PEK_W02	Crediting of laboratory exrcises
F3	PEK_W03	Crediting with grade of classes and exercises
C PEK_W01-3, U01-3, K01-2 Examination		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] *Short Lecture on General Physics*, L. Jacak, Oficyna Wydawnicza PWr 1994 (in Polish and in English)

SECONDARY LITERATURE:

[1] *Feynman Lectures of Physics,* R. Feynman, PWN 2010 (available in English)

[2] *Podstawy fizyki, tom I,* D. Halliday, R. Resnick, J. Walker, PWN 2003 (available in English)

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR
SUBJECT
Physics I
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF Study
Informatics
AND SPECIALIZATION …………………………..

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**	Subject objectives***	Programme content***	Teaching tool number***
PEK_W01 (knowledge)	K1INF_WO3	C1	Lec 1-3 Cl 1-3, Lab 1-2	N 1,2,3,4
PEK_W02	K1INF_W03	C1,C2	Lec 4-7 Cl 4-5, Lab 3-4	N 1-5
PEK_W03	K1INF_W03	C1,C2	Lec 8-9 Cl 6, Lab 5	N 1-5
PEK_W04	K1INF_W03	C1	Lec 10-11 Cl 7, Lab 6-7	N 1-5
PEK_W05	K1INF_W03	C1	Lec 12-15	N 1-5
PEK_U01 (skills)	K1INF_U05	C1	Lec 1-15	N 1-5
PEK_U02	K1INF_U05	C1,C2	Lec 1-15	N 1-5
PEK_U03	K1INF_U05, K1INF_U16	C1,C2	Lec 1-15	N 1-5
PEK_K01 (competences)	K1INF_K01	C2	Lec 5-15	N 4,5
PEK_K02	K1INF_K01,K1INF_KO2	C2	Lec 5-15	N5

** - enter symbols for main-field-of-study/specialization educational effects
*** - from table above