COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics [N1EiT1>FIZ1]

Course

Field of study
Electronics and Telecommunications

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

6,00

Coordinators

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Lecturers

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Prerequisites

A student beginning this course should possess basic knowledge in physics and mathematics (core curriculum for high schools, basic level), ability of solving elementary problems in physics on the basis of the possessed knowledge, ability of obtaining information from indicated sources, as well as exhibit understanding of the necessity of extension of his/her competences and readiness to take up ccoperation within a team

Course objective

Transferring to students the fundamental knowledge in physics within the frame described in program contents, adequate for the course of study, Developing the skills of solving simple problems and performing simple experiments, as well as the analysis of results, on the basis of the knowledge acquired, Developing the abilities of self-education and team work.

Course-related learning outcomes

Knowledge:
A student who passed the course can:
1. define the fundamental physical concepts within the frame of program contents adequate for the course of study, and present simple examples of their application in the surrounding world
2. formulate and explain basic physical laws within the frame of program contents adequate for the course of study, define basic limitations and the scope of applicability, as well as present examples of application for description of phenomena in the surrounding world
3. explain the objective and meaning of simplified models in description of physical phenomena

Skills:
A student who passed the course can:
1. student can use with understanding the indicated sources of knowledge (the list of basic literature references), as well as obtain knowledge from other sources
2. formulate simple conclusions on the basis of performed measurements or obtained results of calculations
3. plan and perform standard measurements of basic physical phenomena, identify and assess the importance of fundamental factors disturbing the measurement
4. perform a qualitative and quantitative analysis of the results of simple physical experiments
5. apply basic physical laws and simplified models in solving of simple problems within the frame of program contents adequate for the course of study

Social competences:
A student who passed the course can:
1. get actively involved in solving of the problems posed, unaided develop and extend his/her competences
2. cooperate within a team, fulfill the duties entrusted within the division of work in the team, show responsibility for his/her own work as well as for the effects of the team work

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Knowledge acquired in the lecture is verified by written exams, realized after each semester. Detailed exam issues are transferred to students during the semester via electronic mail. Exam consists of two parts:
1. 25 test questions, for which 4 answers are provided, including 1 correct answer (scoring: correct answer 1 point, incorrect answer 0 points);
2. problem issue (choice of 1 out of several proposed options), for which a description accounting for the basic aspects quoted is expected (scoring 0-5 points).
Supplementary points for active participation in classes are provided (max. up to 3 points).
Evaluation criteria:
0.0-50.0% - 2.0
50.1-60.0% - 3.0
60.1-70.0% - 3.5
70.1-80.0% - 4.0
80.1-90.0% - 4.5
90.1-…% - 5.0
Skills acquired in laboratory classes (semester 1) are verified by the current assessment of preparation for the classes (form of control is determined by the person responsible for the classes), assessment of realization of the laboratory exercises and reports (containing evaluation of the measurement results and discussion). Individual exercises are assessed separately, final score is the mean of the partial scores.
Skills acquired in tutorials (semester 2) are verified by written test conducted during the last class. The test consists of 4-5 problems, for which various elements of the solution are taken into account in the score. Additionally, points for active participation in tutorials (solving problems on the blackboard) are accounted for.
Evaluation criteria:
0.0-50.0% - 2.0

50.1-60.0% - 3.0
60.1-70.0% - 3.5
70.1-80.0% - 4.0
80.1-90.0% - 4.5
90.1-…% - 5.0

Programme content

I. Lecture
semester 1:
1. Classical mechanics
classification of the kinds of motion
kinematics and dynamics of translational motion (including: laws of dynamics, laws of energy and momentum conservation)
kinematics and dynamics of rotational motion (including: laws of dynamics, law of angular momentum conservation)
free and forced harmonic oscillations (including: resonance phenomenon)
mechanical waves
gravitational interactions
2. Fundamentals of special relativity
3. Thermodynamics
temperature, 0th law of thermodynamics
heat and work, first low of therodynamics
elements of kinetic theory of gases
entropy, second law of thermodynamics
4. Electromagnetism part I
electrostatics part I (including: Gauss"s law)
semester 2:
1. Electromagnetis part II
electorstatics part II (electric field in material media)
electric current
magnetostatics (including: Ampere"s law)
electromagnetic induction (Faraday"s law)
electromagnetic waves (including: energy, momentum, polarization)
2. Optics
geometrical optics (including: laws of reflection and refraction of light)
wave optics (including: interference, diffraction)
3. Fundamentals of quantum physics
quantum nature of light
wave properties of matter
elementary problems of atomic structure
4. Elements of modern physics (brief overview)
selected problems of atomic, molecular, solid-state, nuclear and elementary particle physics
selected problems related to the course of study (atomic time and frequency standards, fundamentals of quantum computing)
II. Laboratory classe (semester 1):
set of exercises covering the following fields:
1. Mechanics (with elements of thermodynamics)
2. Electromagnetism
3. Optics
III. Tutorials (semester 2):
problems covering the following fields (detailed program contents previously discussed in the lecture):
1. Mechanics
2. Thermodynamics
3. Electrostatics
4. Magnetostatics and electromagnetic induction
5. Optics

Teaching methods

I. Lecture (semester 1 and 2)
Traditional lecture - multimedia presentation with experimental demonstrations of selected physical phenomena and calculation examples presented on the blackboard, with elements of discussion with students. Presentation contents (in the form of pdf files), as well as supplemetary materials (descriptions of selected detailed problems related to the lecture"s contents) are transferred to the students directly after the classes via electronic mail.
II. Laboratory classes (semester 1):
Realization of laboratory exercises (performing measurements according to the prescribed course of exercise) in two-person teams
III. Tutorials (semester 2):
Solving of problems (individual, on the blackboard), discussion of results (in the group). Sets of exemplary problems provided for solving during the classes are transferred to the students in the form of pdf files via electronic mail

Bibliography

Basic
1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN Warszawa 2015 (or 2003)
2. St.Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań (current edition)
3. K.Jezierski, B.Kołodka, K.Sierański, Fizyka. Zadania z rozwiązaniami t 1-2, Oficyna Wydawnicza Scripta, Wrocław (current edition)
4. materials for lectures and tutorials (transferred to the students in the form of pdf files)
Additional
1. J.Masalski, Fizyka dla inżynierów t.1-2, WNT Warszawa 1980

Breakdown of average student's workload

	Hours	ECTS
Total workload	260	12,00
Classes requiring direct contact with the teacher	110	4,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	150	8,00