COURSE DESCRIPTION CARD - SYLLABUS

Course name

Physics

Course

Field of study

Logistics

Year/Semester

1/2

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

10

Laboratory classes

10

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

A student has basic knowledge of physics, chemistry and mathematics in the field of secondary school; the ability to solve elementary problems of technical process on the basic of their knowledge; the ability to acquire information from recommended sources and be ready to cooperate within a team.

Course objective

The goal of this course is to inform students about basic physical phenomena and their theoretical description on an academic level. Teaching in physical terms to think like an engineer.

Course-related learning outcomes

Knowledge

1. Student has basic knowledge of physics from secondary school (core curriculum for secondary schools, basic level) [P6S_WG_03].

2. Student has the knowledge of the meaning of laws of physics applied in industrial technologies [P6S_WG_03]

Skills

1. Student is able to apply appropriate experimental and measurement techniques to solve a problem falling within the scope of the studied subject within the framework of general physics [P6S_UW_03]

2. Student is able to identify changes in requirements, standards, regulations, technical progress and on their basis determine the need to supplement the knowledge from indicated sources [P6S_UU_01]

Social competences

1. Student is aware of initiating activities connected with formulating and transmitting information and interacting with society in the field of physics [P6S_KO_02]

2. Student has the ability to work in a team [P6S_KO_02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: the knowledge acquired during the lecture is verified by one 90-minute test in the last lecture. The test consists of 3 open (descriptive) questions and 10 (closed), differently scored and 3 calculation tasks. The pass threshold: 50.1% points.

Score:

<50% D

50,1 - 60% C

60,1 - 70% C plus

70,1 - 80% B

80,1 - 90% B plus

90,1 - 100% A

Laboratory: the skills obtained in the laboratory classes are verified on the basis of the results of the exercises performed. Passing laboratory exercises for positive marks (satisfactory minimum) consists in passing at least 85% of all exercises planned for a given semester.

Programme content

Lecture: Basic units of the SI system. Measurement of Eratosthenes - measurement of circumference of Earth. Newton's principle of conservation of dynamics. Galileo's experiment - free fall of bodies of

different masses. Kinematics and dynamics of a material point and a rigid body. Conservation of energy, momentum, mass, and angular momentum. Kepler's laws, planets of the Solar System. Potential energy in a uniform field and in a central field. Galileo's experiment with the pendulum. Electromagnetic waves. Geometric and wave optics. Low- and high-temperature superconductivity. Principle of operation, basic modes of scanning tunneling microscope and atomic force microscope. Highly oriented pyrolytic graphite (HOPG).

Lab: Classification of uncertainty and measurement error. Basic concepts of measurement statistics. Calculation of arithmetic mean and standard deviation. Calculation of the total derivative and logarithmic derivative for a single measurement. Arithmetic mean and standard deviation rounding rules. Method of linear regression. Principles of graphical processing of measurement results.

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples given on the blackboard.

2. Laboratory classes: presentation illustrated with examples given on the blackboard and performance of exercises designated by the teacher.

Bibliography

Basic

1. Halliday D., Resnick R., Walker J., Podstawy fizyki vol. 1-5, PWN, Warszawa 2003.

2. Szuba S., Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007.

Additional

1. Orear J., Fizyka, WNT 1990.

2. Masalski J., Fizyka dla inżynierów vol. 1-2, WNT, Warszawa 1980.

3.Crease R. P., The Prism and the Pendulum: The Ten Most Beautiful Experiments in Science, Random House 2003.

4. Howland R.,Benatar L., STM / AFM mikroskopy ze skanującą sondą, elementy teorii i praktyki (Park Scientific Instruments) pdf.

5. Kamiński M., Susła B., Giersig M., Kandulski M., Scanning tunneling spectroscopy of periodic nickel nanoparticles, Acta Phys. Polon. A Vol. 104, 351-356, 2003.

6. Kamiński M., Wróblewski M. ,Cęgiel M. , Susła B. , The Study of Electron Properties of Carbon Nanotubes Deposited on HOPG Using Scanning Probe Spectroscopy, Acta Phys. Polon. A Vol. 111, No 5, 661-669, 2007.

7. Kamiński M., Wróblewski M., Susła B., The Measurement of YBa2Cu3O7-δ Single Crystals Using the Atomic/Magnetic Force Microscopy, Acta. Phys. Polon. A Vol. 114, No 1, 91-97,2008.

8. Rozpłoch F., Patyk J. and Stankowski J., Graphenes Bonding Forces in Graphite, Acta. Phys. Polon. A Vol. 112, 557-562, 2007.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for laboratory work - preparation of reports from the exercises performed/ preparation for the final test from the lecture - preparation of open and closed questions/) [1]	75	3,0

[1] delete or add other activities as appropriate