COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics [N1Log2>FIZ]

Course

Field of study
Logistics

Year/Semester
1/2

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
18

Laboratory classes
8

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of high shool physics.

Course objective

The aim of the course is to familiarize students with the basic physical phenomena and their theoretical description at the academic level. To develop students' habit of thinking in physical categories.

Course-related learning outcomes

Knowledge:
1. Student knows the basics issues of chemical transformations, materials science, commodity science and strength of materials and their importnace for industrial and logistics processes [P6S_WG_03]

Skills:
1. Student is able to use appropriate experimental and measurement techniques to solve a problem in physics, including computer simulation [P6S_UW_03]
2. Student is able to identify changes in requirements, standards, regulations, technical progress in the field of physics and, based on them, determine the need to supplement knowledge [P6S_UU_01]

Social competences:
1. Student is aware of initiating activities related to the formulation and transfer of information and cooperation in society in the field of logistics [P6S_KO_02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Knowledge acquired during the lecture is verified by two 45-minute tests carried out during the 7th and 15th lectures. Each of the tests consists of 5 questions. Passing threshold: 50% of points (<=50% - ndst; 50,1-60% - dst; 60,1-70% - dst+; 70,1-80% - db; 80,1-90% - db+; od 90,1% - bdb).
Laboratory:

Programme content

Lecture: Principles of energy conservation, momentum and angular momentum. Kinematics and dynamics of material point and rigid body. Newton's laws of motion. Fluid Mechanics (hydrostatic pressure, barometric formula, Torricelli's equation, Archimedes' principle, equation of continuity, Pascal's principle and hydraulics, Bernoulli's equation). Oscillations (simple harmonic motion, damped oscillations, forced oscillations). Waves (transverse and longitudinal waves, combination of waves). Thermodynamics (temperature and heat, the kinetic theory of gases, the first law of thermodynamics). Electric Charges and Fields (Conductors and Insulators, Coulomb's Law, Electric Field, Electric Dipoles, Gauss's Law, Uniformly Charged Sphere, Electric Potential, Equipotential Surfaces). Current. Resistivity and Resistance. Capacitors and Capacitance. Electrical Energy and Power. Faraday's Law, Lenz's Law. Gravitation (Kepler's Laws of Planetary Motion, Newton's Law of Universal Gravitation).
Laboratory: Principles of energy conservation, momentum, mass and angular momentum. Kinematics and dynamics of material point and rigid body. Mechanical vibration. Special relativity theory.

Course topics

Lecture: uniform motion, uniformly variable motion, non-uniformly motion, free fall and vertical throw, oblique throw, Newton's laws of motion, forces acting in nature, the law of conservation of energy, the law of conservation of momentum, the energy of translational motion and rotational motion of a cylinder, law of universal gravitation and Kepler's laws, moment of inertia, mathematical pendulum, electrical phenomena, conductors, insulators, semiconductors, superconductors, principle of conservation of charge, electric field, magnetic field, direct current, alternating current, thermodynamics, basics of optics, modern physics – STM, AFM.
Laboratory: mechanics, electromagnetism, optics.

Teaching methods

Lecture: multimedia presentation, illustrated by examples on a board, demonstrations of physical experiments.
Laboratory: carrying out experiments that allow practical checking of physical laws.

Bibliography

Basic:
1. Fizyka dla szkół wyższych, tom 1-3, OpenStax.org
https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-1
https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-2
https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-3

Additional:
1. Halliday D., Resnick R., Walker J., Podstawy Fizyki, Wydawnictwo Naukowe PWN, Warszawa, 2018.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	26	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	74	2,50