POZNAN UNIVERSITY OF TECHNOLOGY



EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name Physics [S1ZiIP2>FIZ]

Course				
Field of study Management and Production Engineering		Year/Semester 1/2		
Area of study (specialization)		Profile of study general academi	с	
Level of study first-cycle		Course offered ir Polish	1	
Form of study full-time		Requirements compulsory		
Number of hours				
Lecture 30	Laboratory classe 15	es	Other 0	
Tutorials 15	Projects/seminar 0	S		
Number of credit points 5,00				
Coordinators		Lecturers		

Prerequisites

Basic knowledge concerning physics and mathematics (program base for secondary school, basic level). Solving elementary physical problems based on acquired knowledge, ability to acquire information from given sources. Understanding of necessity of own competence broadening, readiness to cooperate within group.

Course objective

Providing students with basic knowledge of physics, to the extent specified by the curriculum content appropriate to the field of study.

Course-related learning outcomes

Knowledge:

The student is able to define the basic physical concepts in the scope covered by the content programs and give simple examples of their use in the surrounding world

The student is able to formulate and explain basic physical laws within the scope covered by the curriculum content appropriate to the field of study, determine basic limitations and the scope of their applicability, and provide examples of their application to describe phenomena in the surrounding world.

Skills:

The student is able to perform the analysis of the basics physical phenomena.

The student knows how to apply basic physical laws and basic models during problem solutions to the extent covered by the contents relevant to the field of study.

The student is able to use the indicated sources of knowledge with their understanding (list of primary literature) and acquire knowledge from other sources.

Social competences:

The student is able to develop the knowledge in the presented subject. The student is aware of the meaning of the physics in the engineer development.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: written exam ,10 short questions. (<90-100> very good; <80-90) good plus; <70-80) good;

<60-70) satisfactory plus; <50-60) satisfactory; <0-50) unsatisfactory.).

Exercises: 5 tasks to solve (<90-100> very good; <80-90) good plus; <70-80) good; <60-70) satisfactory plus; <50-60) satisfactory; <0-50) unsatisfactory.).

Laboratory: Credit for the course on the basis of an oral or written answer on the content of each laboratory exercise performed, a report on each laboratory exercise as indicated by the instructor of laboratory exercises. In order to receive credit 85% of the laboratories must be passed (a positive grade on the answer and report).

Programme content

Kinematics, dynamics, acoustics, fluid mechanics, gravity, oscillations, basics of electrostatics, electric current.

Course topics

Lecture: Principles of conservation of energy, momentum, angular momentum. Kinematics of a material point. Dynamics of a rigid body. Principles of dynamics. Fundamentals of fluid mechanics (hydrostatic pressure, barometric formula, Archimedes' principle, Pascal's law, hydraulic press, Torricelli's formula, continuity equation of a stream, Bernoulli's law). Gravitation (Kepler's laws, law of universal gravitation). Oscillatory motion (simple harmonic, damped, forced). Wave motion (longitudinal, transverse wave, composition of vibrations). Fundamentals of electrostatics (Coulomb's law, electric field intensity, uniformly charged sphere, uniformly charged spherical surface, Faraday cage, Gauss's law, equipotential surface, charge density). Electric current (resistance, specific resistivity, capacitors, Faraday's law, Lentz's rule)Laboratory: laboratory exercises in the field of mechanics, electromagnetism and optics

Teaching methods

Lecture: multimedial presentation, animations, movies, discussion. Exercises: practical exercises, task solving Laboratory: performing experiments, making a report, discussion, discussion of performed experiments and reports

Bibliography

Basic:

University Physics, vol. 1-3, OpenStax.org https://openstax.org/details/books/university-physics-volume-1 https://openstax.org/details/books/university-physics-volume-2 https://openstax.org/details/books/university-physics-volume-3 S.Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007

Additional: Halliday D., Resnick R., Walker J., Fundamentals of Physics

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	62	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	63	2,50