



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Physics [N1ZiIP2>FIZ]

Course

Field of study

Management and Production Engineering

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

16

Laboratory classes

8

Other

0

Tutorials

8

Projects/seminars

0

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

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. (Assignment of grades to percentage ranges of results: <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 (Assignment of grades to percentage ranges of results: <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, Lenz'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

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	34	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	91	4,00