COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fizyka - Physics

Course

Field of study
Teleinformatics

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
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)

Tutorials
15

Projects/seminars
0/0

Number of credit points

5

Lecturers

Responsible for the course/lecturer:

Dr. Krzysztof Łapsa, The Faculty of Materials Engineering and Technical Physics, phone: 61 665 3168
krzysztof.lapsa@put.poznan.pl

Responsible for the course/lecturer:

Prerequisites

The student starting the course should have basic knowledge of physics and mathematics at the secondary school level. He should also have the ability to solve elementary problems in physics based on his knowledge and obtain information from indicated sources.

Course objective

Getting acquainted with selected concepts, laws and methods of physics to the extent necessary for the quantitative and qualitative description of basic physical phenomena. Getting to know examples of the application of physical laws and phenomena in technology. Developing students' skills in solving physical problems, performing experiments and analyzing the results based on the acquired knowledge.

Course-related learning outcomes

Knowledge

The student can
1. define and explain physical concepts in the scope covered by the program content and give examples of their applications in technology.
2. indicate the laws of physics allowing to build models of real physical phenomena
3. analyze the measurement results

Skills

The student can
1. solve basic physical tasks
2. perform simple physical experiments, calculate given physical quantities and their measurement uncertainties, make graphs, draw conclusions
3. acquire knowledge from various sources

Social competences

1. The student is aware of the importance of knowledge in solving engineering problems
2. The student is able to cooperate within the team, fulfill the assigned duties, demonstrate responsibility for the results of the team's work

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: acquired knowledge is verified during a final test. Passing threshold: 51% of points. Final issues and sample test questions are posted on the eKursy platform.
Accounting exercises: a written test at the end of the semester consisting in solving problems. Passing threshold: 51% of points.
Laboratories: assessment on the basis of tests and written reports after each laboratory exercise. The condition for passing the course is to pass a minimum of 85% of all exercises planned for the student.

Programme content

Lecture:
1. Classical mechanics: dynamics of translational and rotational motion (including: principles of dynamics, principles of conservation of energy, momentum, angular momentum);
2. Harmonic movement: free, damped, forced (resonance phenomenon)
3. Wave motion: types of waves, basics of acoustics, diffraction phenomena, wave interference
4. Mechanisms of heat transfer
5. Gravity field, elements of general relativity theory
6. Electromagnetism: electric field, electric current; motion of charge in electric and magnetic fields, Ampere's law, Faraday's law
7. Optics (wave and particle properties of light)
Exercises:
1. Kinematics of translational and rotational motion.
2. Dynamics of translational and rotational motion.
3. Harmonic motion.
Laboratories:
the subject of laboratory exercises covers various branches of physics related to the lecture.

Teaching methods

Lecture: a lecture with a multimedia presentation (including: drawings, photos, animations, films) supplemented with examples given on the blackboard and demonstrations. The content presented in the slides is placed on the eKursy platform
Tutorials for accounting: students and their teachers count physics tasks related to the subject of the lecture.
Laboratories: students perform physical experiments using available exercise sets, tasks are performed in pairs. Students' progress is monitored on an ongoing basis by the teacher. The student carries out about 7 exercises from various sections of physics.

Bibliography

Basic

1. Lecture materials sent to students by the teacher
2. D. Halliday, R. Resnick, J. Walker, Podstawy fizyki t 1-4, PWN Warszawa 2003
3. K. Jezierski, B. Kołodka, K. Sieranski, Fizyka. Zadania z rozwiązaniami, t 1-2, Oficyna Wydawnicza Scripta, Wrocław Uzupełniająca 1. Fizyka dla szkół wyższych – darmowy podręcznik dostępny w internecie www.openstax.pl 2. C. Bobrowski, Fizyka , PWN PWN 2012
4. S. Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007

Additional

1. Fizyka dla szkół wyższych – free textbook available on the internet www.openstax.pl
2. C. Bobrowski, Fizyka , PWN PWN 2012

Breakdown of average student's workload

	Hours	ECTS
Total workload	116	5.0
Classes requiring direct contact with the teacher	60	3.0
Student's own work (preparation for tests, preparation for tutorials, preparation for laboratory classes, literature studies)	56	2.0