COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics for computer scientists

Course

Field of study
Informatics

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
24

Laboratory classes

Other (e.g. online)

Tutorials
12

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
Dr. Krzysztof Łapsa

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 skills 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.

Course-related learning outcomes

Knowledge

1. is able to define and explain physical concepts in the scope covered by the program content and give examples of their applications in technology.

2. is able to indicate the laws of physics allowing to build models of real physical phenomena

Skills

1. is able to to solve basic physical tasks

2. is able to obtain information from various sources

Social competences

1. is aware of the importance of knowledge in solving engineering problems

2. understands the need and knows the possibilities of continuous training

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: acquired knowledge is verified during two final tests. Passing threshold: 51% of points. Final issues and sample test questions are posted on the eKursy platform.

Tutorials: written test at the end of the semester consisting in solving tasks. Passing threshold: 51% of points.

Programme content

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, phenomena of waves diffraction and 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, Maxwell's equations

7. Optics

8. Fundamentals of quantum physics: particle properties of light; wave properties of matter

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: during the course students together with the teacher count tasks associated with the physics theme of the lecture.

Bibliography

Basic

1. Lecture materials sent to students by the lecturer

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 rozwiazaniami, t 1-2, Oficyna Wydawnicza Scripta, Wrocław

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	85	3,0
Classes requiring direct contact with the teacher	40	1,5
Student's own work (literature studies, solving tasks, preparing for credits) [1]	45	1,5

[1] delete or add other activities as appropriate