COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics for informatics [S1Cybez1>FdI]

Course

Field of study
Cybersecurity

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
24

Other
0

Tutorials
16

Projects/seminars
0

Number of credit points

5,00

Coordinators

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Lecturers

Prerequisites

Students entering the subject should have a basic knowledge of physics and mathematics at the secondary school level. He or she should also have the ability to solve elementary problems in physics on the basis of existing knowledge and to obtain information from indicated sources.

Course objective

To become familiar with selected concepts, laws and methods of physics to the extent necessary for the quantitative and qualitative description of fundamental physical phenomena. To learn examples of the application of physical laws and phenomena in technology.

Course-related learning outcomes

Knowledge:
Students will be able to
1. define and explain physical concepts within the scope of the programme content and give examples of their application in technology.
2. identify laws of physics allowing the construction of models of real physical phenomena

Skills:
Students will be able to
1. solve basic physical tasks
2. obtain information from a variety of sources

Social competences:
1. Student is aware of the importance of knowledge in solving engineering problems
2. Students understands the need for, and knows the opportunities for, continuing education

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: acquired knowledge is verified by examination. Pass mark: 51%. Assessment questions and sample test questions are posted on the eCourses platform.
Calculus exercises: written assessment at the end of the semester consisting of solving calculus tasks. Pass mark: 51%.
Laboratories: The acquired knowledge is assessed in each laboratory session through the evaluation of work progress and laboratory reports. The passing threshold is 75% of completed laboratory sessions. The passing requirement for each laboratory session is obtaining at least 51% of the possible points. The relationship between the grade and the number of points is defined by the Study Regulations. Additionally, the course completion rules and the exact passing thresholds will be communicated to students at the beginning of the semester through the university’s electronic systems and during the first class meeting (in each form of classes).

Programme content

1. Classical mechanics
2. Harmonic motion and wave motion
3. Gravitational field and electric field
4 Electromagnetism
5 Fundamentals of quantum physics
6 Elements of solid state physics, nanotechnology.

Course topics

1. Classical mechanics: dynamics of progressive and rotational motion (including: principles of dynamics, conservation of energy, momentum conservation of energy, momentum, angular momentum).
2. Harmonic motion: free undamped, damped, forced (the phenomenon of resonance).
3. Wave motion: types of waves, fundamentals of acoustics, phenomena of diffraction, interference of waves.
4. Gravitational and electric fields (force, intensity and potential of a field).
5. Electromagnetism (Lorenz force, electrodynamic force, Faraday's law of induction, generalised Ampere's law).
6. Elements of quantum physics, concept of a quantum, quantum operators, wave function, Schrödinger equation.
7. Band theory of solids, quantum size effect, nanotechnology.

Teaching methods

Lecture: lecture with multimedia presentation (including: drawings, photos, animations, films) supplemented by examples given on the blackboard and demonstrations. Content presented on slides is uploaded to the eCourses platform
Calculus Exercises: during the course the students together with the instructor solve problems and tasks in physics related to the implemented lecture topics.
Labs: during the class experiments in mechanics, electricity and optics are carried out.

Bibliography

Basic:
1. Materiały do wykładów przesyłane studentom przez prowadzącego wykład
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 open acces book www.openstax.pl
2. C. Bobrowski, Fizyka , PWN PWN 2012

Breakdown of average student's workload

	Hours	ECTS
Total workload	130	5,00
Classes requiring direct contact with the teacher	70	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	60	2,00