COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics

Course

Field of study	Year/Semester
Automatic Control and Robotics	1/2
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
18	8	
Tutorials	Projects/seminars	
8		

Number of credit points

6

Lecturers

Responsible for the course/lecturer:	Responsible for the course/lecturer:

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Prerequisites

1.Fundamental knowledge of physics; basic level according to the secondary school syllabus
2.Extended knowledge in mathematics, including differential and integral calculus
3.The ability to think logically, use mathematical tools and use them to solve physics tasks at high school level, the ability to learn comprehension and to obtain information from indicated sources
4.Understanding the need to broaden their competence, willingness to cooperate within the team

Course objective

1. Providing students with basic knowledge of physics, to the extent specified by the curriculum content appropriate to the field of study
2. Developing students' skills in solving simple problems and performing simple experiments as well as analyzing results based on the knowledge obtained

Course-related learning outcomes

Knowledge

1.Student has ordered, theoretically founded general knowledge in selected branches of physics, including general mechanics, acoustics, electricity and magnetism, and optics and elements of modern physics, including the knowledge necessary to understand the basic physical phenomena occurring in the elements and systems of automation and robotics, and their surroundings

2. Student is able to define and knows the basic concepts and physical laws and knows simple examples of their application in the surrounding world; has knowledge of the use of knowledge in physics to support the work of an engineer, knows the need to apply physics in engineering and technologies

3.Student has ordered theoretically founded and general knowledge in the field of general mechanics: kinematics and dynamics, including knowledge necessary to understand the principles of modeling and constructing simple mechanical systems

Skills

1.Student is able to use the recommended sources of information and understand the contents (list of fundamental literature) and and acquire knowledge from other sources

2. Student knows how to apply basic physical laws and simplified models in solving simple problems to the extent covered by the curriculum content specific to the field of study

Social competences

1.Student able to actively engage in solving the basic problems independently develop and expand their skills

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written exam in the form of a single-choice test (20 questions, 5 possible answers)
evaluation criteria: the student receives a pre-20 points; correct answer = +5 points;
incorrect answer = -1 point; no response = 0 points; possible range of points: 0-120
grading scale: below 55 2.0, 55-74 3.0, 75-84 3,5, 85-94 4.0, 95-104 4.5, from 105 5.0
Tutorials: Final test (5 tasks), assessment of activity in the classroom
evaluation criteria: each task scored on a scale from 0 to 5 points, the activity classes scored on a scale from 0 to 3 points
grading scale: below 11 2.0, 11-14 3.0, 15-16 3.5, 17-19 4.0, 20-21 4.5, from 22 5.0
Laboratory: assessment of preparation of issues necessary to perform the current exercise; checking the ability to perform the exercise. Assessment of the performance of the current exercise and protocol from the previous exercise

Programme content

1.Classical mechanics: classification of the modes of motion, kinematics and dynamics of translatory motion (including: laws of dynamics, conservation laws for energy and momentum), kinematics and dynamics of rotary motion (including: laws of dynamics, conservation law for angular momentum), harmonic oscillations, simple and driven (including: resonance phenomenon), mechanical waves, gravity interactions

2.Thermodynamics: temperature, heat and mechanical work, I and II thermodynamics laws
3.Electromagnetism: electrostatics (including: Gauss law), electric current, magnetostatics (including: Ampere's law), electromagnetic induction (including: Faraday's law), electromagnetic waves
5.Optics: geometrical optics (including: reflection and refraction laws), wave optics (including: interference and diffraction)
6.Elements of modern physics: quantum nature of light, photoelectric effect, elementary problems of atomic structure, lasers

Teaching methods

Lectures: multimedia presentation, conversation with students
Tutorials: solving problems
Laboratory: laboratory exercises in the field of mechanics, electricity and optics

Bibliography

Basic
1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN Warszawa 2003
2. K.Jezierski, B.Kołodka, K.Sierański, Fizyka. Zadania z rozwiązaniami t 1-2, Oficyna Wydawnicza Scripta, Wrocław
3. J.Kalisz, M.Massalska, J.M.Massalski, Zbiór zadań z fizyki, część I i II, Wydawnictwo Naukowe PWN, Warszawa 1987

Additional
1. J.Masalski, Fizyka dla inżynierów t.1-2, Wydawnictwa Naukowo-Techniczne, 2006
2. Openstax - Fizyka dla szkół wyższych
tom1: https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-1
tom2: https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-2
tom3: https://openstax.org/details/books/fizyka-dla-szk%C3%B3%C5%82-wy%C5%BCszych-tom-3

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	42	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for test/exam) [1]	108	4,0

[1] delete or add other activities as appropriate