COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics [S1AiR1E>Fiz2]

Course

Field of study
Automatic Control and Robotics

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
english

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

Lecturers

Prerequisites

Student has well-structured knowledge in physics including the following fields: mechanics, optics, electricity, magnetism, fundamentals of quantum physics, selected problems of modern physics. Moreover, student is able to formulate and explain fundamental laws of physics in the range determined by the syllabus, are able to identify basic limitations of the laws and the range of their applications for description of phenomena in the real world. Student is able to use the recommended sources of information and understand the contents (list of fundamental literature) and are able to gain knowledge from other sources. Besides, student is able to use the fundamental laws of physics and simplified models in solving simple problems in the range determined by the syllabus. Furthermore, student is able to engage in solving basic problems, are able to extend their competence on their own.

Course objective

The objective of this course is presentation of fundamental knowledge of physics in the range determined by the syllabus of the subject of study. The aim of the course is to stimulate the development of the ability to solve simple problems, perform simple experiments and analyse/interpret their results on the basis of the knowledge acquired. Moreover, the goal of the course is the development of students' ability to work in a team

Course-related learning outcomes

Knowledge:
Knows and understands to an advanced extent - selected facts, objects and phenomena, as well as methods and theories related to them, explaining complex interrelationships between them, being basic general knowledge in the scope of selected branches of general physics covering: thermodynamics, electricity and magnetism, optics, photonics and acoustics, and rigid body physics;
this should include knowledge necessary to understand basic physical phenomena occurring in and around automation and robotics components and systems [K1_W2 (P6S_WG)].
Has a structured and theoretically grounded general knowledge of general mechanics: statics, kinematics and dynamics, including the knowledge necessary to understand the principles of modelling and design of simple mechanical systems [K1_W3 (P6S_WG)].
Skills:
Is able to obtain information from literature, databases and other sources also in a chosen foreign language [K1_U1 (P6S_UW)].
Can interpret with understanding the design technical documentation and simple technological diagrams of automation and robotics systems [K1_U2 (P6S_UW)].
Social competences:
Is ready to critically assess his/her knowledge; understands the need for and knows the possibilities of continuous training - improving professional, personal and social competence, is able to inspire and organize the learning process of others [K1_K1 (P6S_KK)].
The graduate is aware of the need for a professional approach to technical issues, meticulous familiarization with the documentation and environmental conditions in which the equipment and its components can operate. The graduate is ready to observe the rules of professional ethics and to demand it from others, to respect the diversity of opinions and cultures [K1_K5 (P6S_KR)].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Passing of the course is based on oral or written response to questions concerning performed laboratory experiments, preparation of a written report on each laboratory experiment. The necessary condition of pass is to get positive mark for 85% of laboratory experiments (positive mark for the reports).

Programme content

Selected laboratory exercises from the three basic sections: mechanics, electromagnetism and optics. All the exercises are presented in details on webiste dedicated to the physics laboratory course (https://www.phys.put.poznan.pl/), as well as on YouTube channel "I Pracownia Fizyczna".

Teaching methods

Detailed refereeing of the exercise reports by the teacher, discussions over the comments provided, demonstrations, working in teams. Additional informations are provided within the course established on the e-Learning platform "eKursy" at the Poznan University of Technology.

Bibliography

Basic
1) St. Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań.
2) Krzysztof Łapsa, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2008.
3) Physics Laboratory Exercises, red. P. Głowacki, w wersji elektronicznej jako plik Phys_Lab_PUT.pdf
Additional
1) D. Holliday, R. Resnick, J. Walker, Fundamentals of Physics, Wiley 10th edition, 2014
2) S. J. Ling, J. Sanny, W. Moebs, University Physics, vol.1-3, Rice University (2018), (free downlad from: openstax.org)
3) H. Szydłowski, Pracownia fizyczna, PWN, Warszawa.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00