COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics

Course

Field of study
Mechanical engineering
Area of study (specialization)

Level of study
First-cycle studies
Form of study
full-time

Year/Semester
I/II
Profile of study
general academic
Course offered in
Polish
Requirements
compulsory

Number of hours

Lecture
15
Laboratory classes
15
Other (e.g. online)
0
Tutorials
0
Projects/seminars
0

Number of credit points

3

Lecturers

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

Prerequisites

Knowledge: fundamental knowledge of physics and mathematics (program basis for high schools, basic level)

Skills: skills in solving elementary problems in physics based on the knowledge possessed, ability to extract information from the recommended sources

Social competencies: understanding of the necessity of extending one's competences, readiness to cooperate within a team

Course objective

1. Transfer of fundamental knowledge in physics, within the range defined by the program relevant for the field of study

2. Development of skills in solving elementary problems and performing simple experiments, as well as the analysis of results obtained, based on the knowledge possessed

3. Development of skills in self-study and team work

Course-related learning outcomes

Knowledge

1. The student can formulate and explain fundamental physical laws, within the range covered by program relevant for the field of study [K_W02]

2. The student can define general restrictions and the range of their applicability, give examples of their application in phenomena in the surrounding world [K_W02]

3. The student can explain the aim and meaning of simplified models in description of physical phenomena [K_W02]

Skills

1. The student will be able to apply basic physical laws and simplified models to solve simple problems within the scope covered by the range of the field of study [K_U08, K_U09]

2. The student will be able to plan and perform standard measurements of basic physical parameters, identify and evaluate the factors which disturbance measurements [K_U09]

3. The student will be able to perform qualitative and quantitative analysis of the results of simple physical experiments [K_U08, K_U09]

4.Student will be able to formulate simple conclusions based on the obtained calculation results and performed measurements [K_U08, K_U09]

5. The student will be able to use with understanding indicated sources of knowledge (list of basic literature) and obtain knowledge from other sources [K_U01]

Social competences

1. Understand the need for lifelong learning [K_K01]

2. The student is able to interact and work in a group, taking different roles [K_K03]

3. The student will learn the rules of functioning in accordance to the basic ethical principles [K_K05]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Examination under written test with open questions consists of 7 -10 questions. The rating is based on the number of points scored (0-50% - rating 2.0; 50,1-60% - rating 3,0; 60,1-70% - rating 3,5; 70,1-80% - rating 4,0; 80,1-90% - rating 4,5; 90,1-100% - rating 5,0)

Laboratories: Credit based on oral or written response from the scope of content performed laboratory exercises and written reports. The prerequisite is to pass a minimum of 85% of the total planned for student exercises (positive assessment of the responses and reports)

Programme content

1. Electrostatic field: electric charges, Coulomb's Law, description of the electric field, Gaussian law, electrostatic potential, electric dipole - properties, capacitors, capacitance, role of dielectrics

2. Electrical circuits: current, current density vector, Ohm law, resistance, Kirchhoff's laws, basics electrical measurements,

3. Magnetic field: nature, Lorentz and electrodynamic for ces, magnetic induction, Magnetic field around conductors with current, electromotive force of induction, Faraday law

4. Maxwell equations, electromagnetic waves, conclusions from Maxwell's equations, definition and properties

5. Geometric and wave optics: reflection law, lenses, mirrors, simple optical devices, Young's experiment, diffraction grid polarization

6. Elements of modern physics: selected issues of modern physics, nanotechnology

Teaching methods

Bibliography

Basic

Basic bibliography:

1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN Warszawa 2003

2. St.Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007

3. K.Łapsa, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2008

Additional

1. J.Masalski, Fizyka dla inżynierow t.1-2, WNT Warszawa 1980

3. H. Szydłowski, Pracownia fizyczna, PWN, Warszawa 2003

Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,0
Classes requiring direct contact with the teacher	35	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	55	1

[1] delete or add other activities as appropriate