COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technical Physics

Course

Field of study

MANAGEMENT AND PRODUCTION ENGINEERING

Year/Semester

1/1

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

Other (e.g. online)

Tutorials

10

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

Basic knowledge of physics and mathematics (core curriculum for high schools, basic level). The ability to solve elementary problems in physics based on knowledge and the ability to obtain information from specified sources. Understanding the need to broaden your competences, readiness to cooperate within a team

Course objective

Mastering the basic knowledge of physics by students, to the extent specified in the program content

Mastering the students' ability to solve simple problems and perform simple experiments as well as analyze the results based on the knowledge obtained

Developing students' teamwork skills

Course-related learning outcomes

Knowledge

The student knows the basic physical concepts in the field covered by the program content relevant to the field of study and provide simple examples of their use in the surrounding world.

The student knows how to formulate and explain the basic physical laws in the scope covered by the curriculum content relevant to the field of study and determine the basic restrictions and scope of their applicability.

The student can give examples of the use of basic physical laws to describe phenomena in the surrounding world.

The student knows how to explain the purpose and meaning of simplified models in the description of physical phenomena

Skills

The student is able to apply the basic physical laws and simplified models in solving simple problems in the scope covered by program content.

The student is able to apply his knowledge of physics, supplemented with information obtained from literature and other sources to explain the principles of technical devices.

Social competences

The student understands the need for further learning.

The student is aware of the importance of physical knowledge in engineering education.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired as part of the lecture is verified on the written test. The test consists of 20 questions and calculation tasks, equally scored. Passing threshold: 50.1%.

The knowledge and skills acquired during the tutorials will be verified on the basis of the final test during the last class in the semester. The colloquium consists of 8 calculation tasks, of which the student is to solve 5 selected by him. Passing threshold 50.1%. Activity class is also scored.

Programme content

Lecture and exercises:

Material point kinematics. Principles of point dynamics, examples of force models. Apparent forces in non-inertial systems. Momentum and principle of conservation of momentum. Center of mass of the points system. Work and energy. Examples of potential energy. The relationship of potential energy and strength. The principle of conservation of energy. The momentum of point and material points system. The principle of conservation of angular momentum. The basic problem of mechanics. Numerous

examples of rigid body motion. Harmonic movement. The resonance phenomenon. Wave motion, superposition principle, Huygens principle, Fermat principle. Thermodynamics. Vector and scalar description of the electric field. Gauss's law. Laws describing electric current. Vector description of the magnetic field of Maxwell's law and their relationship with special relativity.

Teaching methods

Lectures: lecture with multimedia presentation (including drawings, photos, animations, video materials) supplemented with examples given on the board, taking into account various aspects of the issues presented, including: economic, ecological, legal and social issues, presenting a new topic preceded by a reminder of related content, known to students in other subjects.

Tutorials: solving tasks from indicated textbooks, content of tasks selected to deal with practical issues occurring in technology and everyday life, discussion.

Bibliography

Basic

1. D. Halliday, R. Resnick, J. Walker, Podstawy fizyki, t. 1-5, PWN Warszawa 2007

2. K. Jezierski, B. Kołodka, K. Sierański, Fizyka. Zadania z rozwiązaniami t 1-2, Oficyna Wydawnicza Scripta, Wrocław

3. K .Sieranski, P. Sitarek, K. Jezierski, Repetytorium wzory i prawa z objasnieniami, Oficyna Wydawnicza Scripta, Wrocław 2002

Additional

1. R. P. Feynman, R. B. Leighton, M. Sands, Feynmana wykłady z fizyki tomy 1-2, PWN, Warszawa 2014

2. S. J. Ling, J. Sanny, W. Moebs, Fizyka - dla szkół wyższych, tomy 1-2, www.openstax.org, Polska 2018

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

4. K. Jezierski, B. Kołodka, K .Sieranski, Wzory i prawa z objasnieniami, czesc II, Oficyna Wydawnicza Scripta, Wrocław 1995

5. K. Sieranski, J. Szatkowski Wzory i prawa z objasnieniami, czesc III, Oficyna Wydawnicza Scripta, Wrocław 1996

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	40	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests [1]	60	2,0

[1] delete or add other activities as appropriate