



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Contemporary physics

Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

15

Tutorials

Laboratory classes

0

Projects/seminars

0

Other (e.g. online)

0

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

dr Jędrzej Łukasiewicz

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Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge: Basics of mathematics, chemistry and physics.



Skills: Using literature (textbooks, internet), the ability to perceive lecture content

Social competences: Awareness of the need to deepen engineering knowledge and its place in everyday life

Course objective

Providing students with basic knowledge of the physical aspects of the functioning of the world around us in the scope defined by the curriculum content appropriate for the field of study.

Course-related learning outcomes

Knowledge

Has knowledge in the field of physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialist lectures in the field of the theory of construction materials and materials science, theory of machines and mechanisms, theory of electric drives and mechatronic systems.

Has ordered basic knowledge of the main divisions of technical mechanics: statics, kinematics and dynamics of a material point and a rigid body.

Has a basic knowledge of the methods of linear measurements, measurements of stresses, strains, velocities, temperatures and fluid streams, including measurements of these quantities by electrical means.

Skills

Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.

Can properly use modern equipment for measuring major physical quantities, used in machine research and production control.

Has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.

Social competences

Is ready to critically assess his knowledge and received content.

Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on his own.

Is ready to initiate actions for the public interest.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written credit based on orally asked questions. In case of doubts related to the assessment, an oral exam is allowed.

Programme content



1. Origin of the universe, relict radiation.
2. Electromagnetic radiation and quanta.
3. Waves of matter.
4. Quantum world description, PSI function
5. Examples of the use of quantum description.
6. Statistical physics.
7. The structure of particles.
8. Solid state physics.
9. Superconductivity

Teaching methods

Lecture with multimedia presentation

Bibliography

Basic

1. Paul. A. Tipler - Fizyka współczesna
2. Jerzy Ginter - Wstęp do fizyki atomu, cząsteczki i ciała stałego

Additional

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Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	15	0,5
Student's own work (literature studies, preparation for lectures /classes (tutorials), preparation for tests/test/final test/, project/presentation preparation, writing essay, case-study analysis, activity during meetings, watching movies) ¹	10	0,5

¹ delete or add other activities as appropriate