



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Contemporary physics

### Course

Field of study

Year/Semester

Transport

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

full-time

compulsory

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

Tutorials

Projects/seminars

### Number of credit points

1

### Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

Dr. Jędrzej Łukasiewicz

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Faculty of Civil and Transport Engineering

ul. Piotrowo 3, 60-965 Poznań

### Prerequisites

Basics of mathematics, chemistry and physics,

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

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



The student has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems

#### Skills

The student is able, when formulating and solving tasks in the field of transport, to apply appropriately selected methods, including analytical, simulation or experimental methods

#### Social competences

The student understands that in technology, knowledge and skills very quickly become obsolete

The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life

#### 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

Multimedia presentation

#### Bibliography

Basic

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



Additional

### Breakdown of average student's workload

|  | Hours | ECTS |
|--|-------|------|
| Total workload   | 30    | 1,0  |
| Classes requiring direct contact with the teacher  | 15    | 0,5  |
| Student's own work (literature studies, preparation for tutorials, preparation for tests) <sup>1</sup> | 15    | 0,5  |

<sup>1</sup> delete or add other activities as appropriate