



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technical Physics

### Course

Field of study

Management engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

elective

### Number of hours

Lecture

16

Laboratory classes

Other (e.g. online)

Tutorials

14

Projects/seminars

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

Ph.D., Eng. Anna Dychalska

Responsible for the course/lecturer:

Mail to: [anna.dychalska@put.poznan.pl](mailto:anna.dychalska@put.poznan.pl)

Faculty of Materials Engineering and Technical  
Physics

ul. Piotrowo 3, 61-138 Poznań

### Prerequisites

The student starting this subject should have a basic knowledge of mathematics, including the ability to calculate simple derivatives and integrals. She/he should also be able to read with understanding and to obtain information from specified sources.

### Course objective

To provide students with the basic knowledge of Physics necessary for the proper use of technical solutions in various fields of technology. Understanding of the basic physical laws and their relationship to the surrounding world. Developing students' skills to solve problems of interdisciplinary issues.

### Course-related learning outcomes

Knowledge



Knows the basic methods, techniques, tools and materials used to solve simple engineering tasks in the field of machine construction and operation [P6S\_WG\_16]

Knows typical industrial technologies and deeply knows technologies of machine construction and operation [P6S\_WG\_17]

#### Skills

Is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks [P6S\_UW\_10]

Is able to apply typical methods of solving simple problems in the field of machine construction and operation [P6S\_UW\_15]

#### Social competences

Is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the associated responsibility for decisions [P6S\_KR\_0]

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified by a test, carried out at the last lecture. The test consists of 10-15 closed questions, with the same score. Passing threshold: 50% of points. Topic for passing on the basis of which the test questions are formed will be given to students using the university's e-mail system and / or on the ekursy platform.

The skills acquired during the calculus classes are verified by solving 1 task after discussing each of the five foreseen topics

Formative assessment: based on an assessment of the current progress in the implementation of tasks assessed by written work.

Summative assessment: based on the results of the average partial grades of the formulating assessment. Passing threshold: 50% of points.

#### Programme content

The program of the subject covers such issues as: vectors - vector description and basic operations on vectors; translational motion - kinematic of point-like particle; dynamic of point-like particle- principles of energy, momentum, mass and moment conservation; electrostatics - analysis of the charge behavior in the electrostatic field, Maxwell equations, electromagnetic waves; thermodynamics, elements of modern physics .

#### Teaching methods

1. Informative lecture - multimedia presentation, illustrated with examples of analysis of various problems related to engineering issues.



2. Exercises - multimedia presentation illustrated with examples of solving tasks and performing tasks given by the teacher - practical exercises.

### Bibliography

#### Basic

1. Online textbooks: Fizyka dla szkół wyższych:

<https://openstax.pl/pl/>

2. Marta Skorko, Fizyka, podręcznik dla studentów wyższych technicznych studiów zawodowych

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

4. J. Massalski, M. Massalska. Zadania z rozwiązaniami t 1-2.

#### Additional

Fizyka dla inżynierów cz. 1 i 2, J. Massalski, M. Massalska, Wydawnictwa Naukowo-Techniczne, Warszawa, 2006

### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	40	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests, project preparation) <sup>1</sup>	60	2,5

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