



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Physics [S1MiBM1>FIZ1]

### Course

Field of study

Mechanical Engineering

Year/Semester

1/1

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

### Number of credit points

4,00

### Coordinators

### Lecturers

dr inż. Tomasz Grzela

tomasz.grzela@put.poznan.pl

dr Maciej Kamiński

maciej.kaminski@put.poznan.pl

dr hab. inż. Wojciech Koczorowski prof. PP

wojciech.koczorowski@put.poznan.pl

### 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. 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:

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Rating forming and summarizing:

Lectures: 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)

Tutorials: credit on the basis of two written tests (in the middle and at the end of the semester) and active participation in classes. At the tests to calculate a total of 3-7 tasks. The evaluation criterion is the total number of points gained by the student (0-50% - 2.0 rating; 50,1-60% - rating of 3.0, 60,1-70% - 3.5 rating; 70,1-80% - Assessment 4.0; 80,1-90% - Assessment 4.5; 90,1-100% - rating of 5.0)

### Programme content

1. Classical Mechanics: movements classification; kinematics and dynamics of movement (including laws of motion, conservation of energy, momentum, angular momentum); free and forced harmonic vibrations (including the phenomenon of resonance)
2. Elements of thermodynamics: heat transfer mechanisms, elements of kinetic theory of ideal gas
3. The gravitational field
4. Basis of analysis of measurement errors and presentation of results: including: Types of errors, Determination of errors: accidental, systematic and fatal, Determination of errors of complex values, Plots and linear regression.

### Teaching methods

none

### Bibliography

Basic

1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN Warszawa 2003
  2. K.Jeziński, B.Kołodka, K.Sierański, Fizyka. Zadania z rozwiązaniami t 1-2, Oficyna Wydawnicza
  3. J. Kalisz, M. Massalska, J. Massalski, Zbiór zadań z fizyki z rozwiązaniami t.1-2, PWN, 1987
  4. St.Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007
- Additional

1. J.Massalski, Fizyka dla inżynierów t.1-2, WNT Warszawa 1980
2. K.Łapsa, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2008
3. H. Szydłowski, Pracownia fizyczna, PWN, Warszawa 2003

### Breakdown of average student's workload

	Hours	ECTS
Total workload	120	4,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	70	2,00