

SYLLABUS

Name: Physics (BudAB>SI2PHYSIC19)

Name in Polish:

Name in English: Physics

Information on course:

Course offered by department: Faculty of Civil Engineering
Course for department: Silesian University of Technology

Default type of course examination report:

ZAL

Language:

English

Course homepage:

<https://platforma.polsl.pl/rif/course/view.php?id=460>

Short description:

Participation in the classes will enable students to:

- acquire and develop basic knowledge of physics used by engineers in modern technology and technology;
- gain practical laboratory skills, i.e. the ability to plan and perform experiments, process the results obtained, critically analyze them and draw conclusions;
- education - the ability to solve physical problems using mathematical tools.

Description:

lecture: 30 h, exercises: 15 h, laboratory: 15 h

1. Vector quantities in physics: velocity, momentum, force (determination of resultants, decomposition into components), work, angular momentum, torque. SI system.
2. Progressive motion of a material point and the quantities describing it (uniform rectilinear motion, uniform rectilinear motion with acceleration),
3. Motion of a material point along a circle and the quantities that describe it (period, angular velocity, centripetal acceleration), uniform motion variable in a circle - tangential and radial acceleration,
4. Basics of rotational motion of a rigid body: angular velocity, moment of inertia.
5. Motion in a gravitational field (vertical, horizontal, and oblique projectiles),
6. Principles of dynamics of systems of material points (inclined plane, resistance to motion), real forces, inertial system, apparent forces, non-inertial,
7. Work, power, energy. Conservation laws in physics (conservation of energy, momentum, angular momentum).
8. Basis of electricity, magnetism, optics and quantum physics.

lecture 30 h, exercises 15 h, laboratory 15 h = 60 contact hours

preparing to exam and elaborates: 10 h, preparing to exercises 10 h, elaborating of laboratory: 10 h = 30 non contact hours.

Final hours = 90 h; 6 ECTS

Bibliography:

english versions of:

D. Halliday, R. Resnick, J. Walker, Podstawy Fizyki, tom 1-2, PWN, Warszawa, 2005-2006, 2011-2012.

R.P. Feynman, R.B. Leighton, M. Sands, Feynmana wykłady z fizyki, PWN Warszawa 2001

<https://openstax.org/details/books/fizyka-dla-szkol-wyzszych-tom-1>

Irodov, Problems in general physics, Mir Publishers, Moscow

Learning outcomes:

K1A_W01 Introduction to Physics. General principles of physics, quantities

Physical, fundamental interactions. Selected issues in the field of mechanics material point and rigid body, motion oscillation and wave, basics of

thermodynamics, electricity, magnetism, optics, quantum physics.

The student knows and understands: basic issues related to general principles of physics, physical quantities, fundamental interactions, selected topics from the field of mechanics of a material point and a rigid body.

K1A_U05 can solve basic problems in classical mechanics of a point mass, a rigid body, and gravity with using simple mathematical tools.

Use their knowledge to analyze and solve typical tasks in mechanics, thermodynamics, electricity, magnetism, optics, quantum physics using advanced mathematical tools

Assessment methods and assessment criteria:

PREREQUISITES: basis of mathematics

The condition for passing the subject is to obtain a positive evaluation of activity in the exercises (oral answers at the board - (a solution to a task from the set) or positive grades from written "pop quizzes" on the material from previous classes or a comprehensive final exam at the end of the semester.

The lecture/exam is graded through a 10-question test in which the student makes simple estimates/calculations for each question.

The answer must be justified independently - passing from 5.5 points / 10 points. Grades can be increased by homework presented on in lectures - optional during the semester.

The student can correct the proposed final grades during the next assessment/examination periods.

The syllabus is effective from the 2nd semester/academic year 2024/25 and its content is not subject to change during the semester.

A student who wishes to redo an exam must do so within two weeks of the semester.

To change a course grade, a student should contact the instructor within the first two weeks of the semester.

W celu przepisania ocen cząstkowych student powinien zgłosić się do prowadzącego w ciągu dwóch pierwszych tygodni semestru.

Element of course groups in various terms:

Course group description	First term	Last term

Course group description	First term	Last term
<i>missing group description in English</i> (BudAB-S1-2019-sem2)	2020/2021-L	

Course credits in various terms:

<without a specific program>			
Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	6	2020/2021-Z	