



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

physics

### Course

Field of study

Environmental Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

I/1

Profile of study

general academic

Course offered in

polish&english

Requirements

compulsory

### Number of hours

Lecture

14

Laboratory classes

Other (e.g. online)

Tutorials

14

Projects/seminars

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

prof.dr hab. Grażyna Białek-Bylka

Responsible for the course/lecturer:

### Prerequisites

Knowledge Basic knowledge in physics and mathematics (basic level of elementary and secondary school)

Skills Skills in solving of elementary problems of physics on the basis of personal knowledge and information from known sources

Social competencies Understanding of the necessity of the broadening of the self-competence and readiness to cooperate in group

### Course objective

As a result of teaching at the University of Technology one ought expect good background in physics as outcome giving a base for the logical presentation and understanding technical problems.

### Course-related learning outcomes

Knowledge

1. Give definitions of the basic physical formulas and examples of their application
2. Explain the basic physical laws and explain conditions for their application



3. Explain the goal and the significance of the models in the explanation of the physical phenomenon

#### Skills

1. Apply the basic physical laws and simple models in the solving of the uncomplicated problems
2. Make plan and perform standard measurements of the basic physical phenomenon and evaluate the conditions disturbing measurement
3. Give quantity and quality analyses of simple physical experiments
4. Formulate simple conclusions on the basis of the calculation results
5. Use the literature and also other sources of knowledge

#### Social competences

1. Actively take part in the solving problems and is independent and capable to extend self-competences
2. Responsible collaborate in the team
3. Behave according to the ethic roles

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

Learning outcomes presented above are verified as follows:

Written examination and test: pass 50.1%-70.0%, good 70.1%-90.0%, very good from 90.1%

Classes activity evaluation: moderation engagement of student in the problem solving, student is interested in problem solving

#### Programme content

Mechanics: kinetics and dynamics, the law of conservation of energy, gravitational potential energy, power, stable and unstable equilibrium, linear momentum and collisions (momentum and its relation to force, conservation of momentum, elastic and inelastic collisions, centre of mass), rotational motion (rotational dynamics, angular momentum and its conservation, rotational kinetics energy).

Electricity: electric charge and charge conservation, insulators and conductors, Coulomb's law, the electric field (point charge, dipole), motion of a charge particle in an electric field, Gauss' law and its application, electric potential, capacitance and resistance, circuits.

#### Teaching methods

Lectures with computer simulations and multimedial effects, tutorials-examples and calculations on the blackboard.

#### Bibliography

Basic

1. D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, J. Wiley & Sons, Inc., New York, Chichester, Brisbane, Toronto, Singapore, 1997.



Additional

1. D. C. Giancoli, Physics for Scientists & Engineers, Prentice Hall, Upper Saddle River, New Jersey 07458, 2000

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	30 (15+15)	1,2
Student's own work (literature studies, preparation for tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	70	2,8

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