COURSE DESCRIPTION CARD - SYLLABUS

Course name
physics

Course

Field of study
Environmental Engineering

Year/Semester
I/1

Area of study (specialization)

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish&english

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)

Tutorials
15

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 and measurements

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%

Laboratory's reports, answer the questions (written and oral): student is able to distinguish between different kinds of errors and also calculate uncertainty in more complicated situations and besides these abilities student is also able to use laboratory equipment?s and find out uncertainty calculate total or logarithmic differential; student is able recalculate units and give graphical analysis of results (linear regression) and student knows how to present uncertainties on graphs, student knows how correctly present data with uncertainties, student is able to find out conclusion concerning measured value with value from literature tables.

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 & 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, experiments acording to graphic and guide book.

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	110	4,0
Classes requiring direct contact with the teacher	45 (15+15+15)	1,6
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	65	2,4

[1] delete or add other activities as appropriate