COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics [N1TCh2>FIZ1]

Course

Field of study
Chemical Technology

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
part-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
0

Other
0

Tutorials
10

Projects/seminars
0

Number of credit points

6,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge concerning physics and mathematics. Solving elementary physical problems based on acquired knowledge, ability to acquire information from given sources. Understanding of necessity of own competence broadening, readiness to cooperate within group.

Course objective

Educate students in the basic concepts and physical laws in the field of classical physics, including their applications in technical sciences, develop students 'skills to solve problems in the field of technical physics, recognize its potential applications in the studied field, develop students' teamwork skills.

Course-related learning outcomes

Knowledge:
Advanced knowledge within classical mechanics, thermodynamics, gravity and electrical interactions with special emphasis on their applications in studied subject. Basic knowledge about constructing,

principles of working and lifetime of modern engineering systems. (K_W02)

Skills:
Using (with understanding) recommended knowledge sources (catalog data, applications notes) and derive knowledge from other sources for self-education purpose. Carry out and analyze basic physical experiments and measurements on electrical systems with results interpretation and presentation in numerical and graphical forms.(K_U01, K_U02)

Social competences:
Understanding of role of knowledge in problems solutions and in increasing level of professional, personal and social skills. Ability of logical and enterprising thinking in electrical engineering field. (K_K01,K_K02)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Oral or written exam that is aimed at students knowledge evaluation based on their explanations of choosen physics problems, current evaluation of students activity.
Math exercises: Substantial evaluation of methods of problem solving: proper physical formula application, logical line of thinking, mathematical efficiency in formula calculations also with numerical data and units, capabilities to solve problems using different methods, clarity and aesthetics of task solutions, current evaluation of students activity.
Exam will take place in a stationary or remote form on the Ekursy platform (only if it will be impossible to write the exam in a stationary form).

Programme content

Issue related to classical mechanics, thermodynamics, gravitational interactions, electromagnetic interactions, optics, modern physics achievements.

Course topics

Classical mechanics: movement classification, work, power, potential and kinetic energy, conservative and non-conservative forces, dynamics of linear and curvilinear motion (dynamics and conservation rules), harmonic free vibrations, forced vibrations (resonance), damping vibrations, description of periodic processes with vector diagrams, mechanical waves.
Thermodynamics: pressure, temperature, 0 thermodynamics law, heat, heat conduction, 1st law of thermodynamics, elements of kinetic gas theory, gas processes, heat machines, 2nd law of thermodynamics.
Gravitational interactions: law of universal gravitation, scalar and vector description of gravitational field.
Electromagnetic interactions: magnetostatics (Gauss, Ampere's, Biot-Savart's laws), magnetic properties of matter, charge movement in magnetic field (Lorentz's, electrodynamic forces), electromagnetic induction (Faraday's law), Maxwell's equations and electromagnetic waves.
Optics: geometrical optics (reflection and refraction laws), wave optics (interference and diffraction)
Modern physics achievements: elements of special relativity theory, quantum theory basic elements. chosen aspects of atomic, molecular, solid state, nuclear and particles physics problems connected with study.

Teaching methods

Lecture: multimedial presentation, animations, movies.
In special cases, the online form of the lecture is allowed.
Math exercises: practical exercises.

Bibliography

Basic:
1. J. Orear, Fizyka, t. 1- 2, WNT, W-wa 1990
2. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN, Warszawa 2005.
3.K.Jezierski, B.Kołodka, K.Sierański, Fizyka. Zadania z rozwiązaniami t 1-2, Oficyna Wydawnicza Scripta,

Wrocław 2007

Additional:
1.J.Massalski, M.Massalska, Fizyka dla inżynierów t.1-2, WNT, Warszawa 2006
2. e-Fizyka" to internet course z Fizyki AGH : Autors: Zbigniew Kąkol i Jan Żukrowski

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	105	4,00