COURSE DESCRIPTION CARD - SYLLABUS

Course name
Physics [N1Eltech1>Fiz2]

Course

Field of study
Electrical Engineering

Year/Semester
1/2

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
10

Laboratory classes
12

Other (e.g. online)
0

Tutorials
10

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Presentation of fundamental knowledge of physics in the range determined by the syllabus of the subject of study.Development ability to solve physical problems, to perceive potential applications in studied subject, doing experiments and analyze results based on acquired knowledge.Mould student’s abilities within group cooperation.

Course objective

Students have fundamental knowledge in the following areas of physics electricity, magnetism, optics selected problems of theory of relativity ,selected problems of nuclear physics, selected problems of quantum physics. Students are able to formulate and explain basic physical laws, are able to define their range of applications with special emphasis on studied subject.

Course-related learning outcomes

Knowledge:
Advanced knowledge within electric and magnetics, optics and chosen aspects of modern physicswith special emphasis on their applications in studied subject. Basic knowledge about constructing, principles of working and lifetime of modern engineering systems.

Skills:
1.Students are able to use the fundamental laws of physics and simplified models in solving simple problems in the range determined by the syllabus.
2. Students are able to use (with understanding) recommended knowledge sources (basic literature index) and derive knowledge from other sources for self-education purpose .
3. Students are able to carry out and analyze basic physical experiments (by oneself and in group).

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

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture:
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
Laboratory:
Oral or written verification of students mastering of basic description of observed phenomenon, evaluation of technical and correctness of measurement realization in frame of exercise and written acquisition of results, evaluation of written report: description of result and measurement uncertainties, conclusions validity, clarity and aesthetics of report, evaluation of ability to cooperate within group, current evaluation of students activity

Programme content

1.Electric field.
2.Magnetic field.
3. Maxwell"s equations.
4. Electromagnetic waves.
5. Geometrical optics and wave optics. Wave-corpuscular dualism.

Course topics

1.Electric charge, Coulomb's law ,Gauss's law, conductors, motion of charge in an electric field, electric current (Ohm's law, Kirchhoff's laws), electrical properties of matter.
2.Magnetostatics (Gauss's law, Ampere's law, Biot-Savart's law), magnetic properties of matter, motion of charges in a magnetic field (Lorentz force, electrodynamic force magnetic field (Lorentz force, electrodynamic force), electromagnetic induction (Faraday's law).
3. Gauss's law for electric and magnetic fields, Amper's law and Faraday's law.
4.Source and range of electromagnetic waves and application.
5.Reflection and refraction laws, interference and diffraction. Photoelectric effect and Compton phenomenon

Teaching methods

Lecture: multimedial presentation, animations, movies.
Math exercises: practical exercises.
Laboratory: simulations, experiments supported also by computer.

Bibliography

Basic
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
4. S. Szuba, Ćwiczenia laboratoryjne z fizyki , Wyd. Politechniki Poznańskiej, 2004
Additional
1. H. Szydłowski, Pracownia fizyczna, PWN, Warszawa 2003 M.Massalska, Fizyka dla inżynierów t.1-2, WNT, Warszawa 2006
2. J.Massalski, M.Massalska, Fizyka dla inżynierów t.1-2, WNT, Warszawa 2006
3. e-Fizyka" e-Fizyka" to internet course z Fizyki AGH : Autor: Zbigniew Kąkol i Jan Żukrowski.

Breakdown of average student's workload

	Hours	ECTS
Total workload	110	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)	60	2,00