STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Physics		**1010314411010440037**

Field of study	Profile of study (general academic, practical)	Year /Semester
Power Engineering	**general academic**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**part-time**

No. of hours					No. of credits
Lecture: **30**	Classes: **-**	Laboratory: **30**	Project/seminars: **-**		**5**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
other	**university-wide**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**5 100%**
Technical sciences	**5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of physics and mathematics (the secondary school curriculum, primary level)
2	**Skills**	Skill in elementary physical problem solving, skill in acquiring information from listed sources
3	**Social competencies**	Understanding the necesity of personal competence development, readiness to cooperate in a team

Assumptions and objectives of the course:

1. Introduction of basic knowledge in physics within the scope of curriculum content specific for the field of study
2. Development of skills in simple problem solving, carying out simple experiments and results analysis
3. Team work ability development

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student, who has completed the course, is able to define basic physical terms within the scope of curriculum content specific for the field of study and give simple examples of their application in real world - [K_W02 +++]
2. Student, who has completed the course, is able to formulate and explain basic physics laws within the scope of curriculum content specific for the field of study, explain the range of application and give examples of their application to real world problems - [K_W02 +++]
3. Student, who has completed the course, is able to explain purpose and importance of simplified models in physical phenomena description - [K_W02 +++]

Skills:

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1. Student, who has completed the course, is able to apply basic physics laws and simplified models to solve simple problems within the scope of curriculum content specific for the field of study - [-]

2. Student, who has completed the course, is able to prepare and carry out standard measurements of basic physical phenomena, identify basic sources of measurement errors - [K_U10 ++]

3. Student, who has completed the course, is able to perform qualitative and quantitative analysis of simple physical experiments results - [K_U11 ++]

4. Student, who has completed the course, is able to formulate basic conclusions concerning obtained results of measurements and calculations - [K_U11 ++]

5. Student, who has completed the course, is able to make use of the listed sources of knowledge (basic literature list) and acquire information from other sources - [K_U01 +++, K_U06 +++]

Social competencies:

1. Student, who has completed the course, is able to actively involve in solving problems, develop and expand personal competence - [K_K01 ++]

2. Student, who has completed the course, is able to work in a team, carry out tasks arising from dividing up of work in a team, to take responsibility for team work results - [K_K04 +++]

Assessment methods of study outcomes

Lecture:

- assessment of knowledge and skills during an oral and written exam

Lab classes:

- continuous assessment of knowledge of current exercise and ability to make use of the listed literature, performed in written or oral form
- continuous assessment of planning and carrying out standard measurements of basic physical quantities ability
- assessment of team work skill
- assessment of skill in analysis of measurements and presentation of results in written reports

Course description

1. Classical mechanics
- motion classification
- kinematics and dynamics of linear motion (including Newton's laws, conservation of energy and linear momentum)
- kinematics and dynamics of circular motion (including Newton's laws, conservation of angular momentum)
- simple and forced harmonic oscillations (resonance)
- mechanical waves
- gravity

2. The fundamentals of fluid mechanics

3. Thermodynamics
- temperature, the zeroth law of thermodynamics
- heat and work, the first law of thermodynamics
- elements of the kinetic theory of gases
- entropy, the second law of thermodynamics

4. Electromagnetism
- electrostatics
- electric current
- magnetostatics
- induction (Faraday?s law)
- electromagnetic waves

5. Optics
- geometric optics (including reflection and refraction of light)
- wave optics (including interference and diffraction)

6. The fundamentals of quantum physics
- quantum nature of ligh
- wave properties of matter
- elementary problems concerning atomic strucure

7. Elements of contemporary physics (short review)
- selected problems of atomic, molecular, solid state and nuclear physics

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Basic bibliography:

1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, Wydawnictwo Naukowe PWN, Warszawa 2005
2. J.Walker, Podstawy fizyki. Zbiór zadań, Wydawnictwo Naukowe PWN, Warszawa 2008
3. .Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007

Additional bibliography:

1. J.Masalski, Fizyka dla inżynierów t.1-2, WNT Warszawa 2006
2. K.Łapsa, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2008
3. H. Szydłowski, Pracownia fizyczna, Wydawnictwo Naukowe PWN, Warszawa 2003

Result of average student's workload

Activity	Time (working hours)
1. Participation in the lectures	30
2. Participation in lab classes	30
3. Preparation for lab classes	36
4. Making reports of lab classes (homework)	24
5. Participation in consultations on the lectures and lab classes	3
6. Preparation for the exam	20
7. Participation in the exam	5

Student's workload

Source of workload	hours	ECTS
Total workload	148	5
Contact hours	68	3
Practical activities	90	4

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