STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Physics		**1010701211010430002**

Field of study	Profile of study (general academic, practical)	Year /Semester
Chemical Technology	**(brak)**	**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	**full-time**

No. of hours	No. of credits
Lecture: **3** Classes: **1** Laboratory: **-** Project/seminars: **-**	**5**

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

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**7 100%**

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 (core curriculum for the secondary school level)
2	**Skills**	Basic knowledge of physics and mathematics (core curriculum for the secondary school level)
3	**Social competencies**	Understanding the need to broaden own competences, willingness to work in a team.

Assumptions and objectives of the course:

Course objectives:

1. Advancing the students? basic knowledge of physics to the extent specified by the curriculum
2. Enhancing the students' ability to solve simple problems, carry out simple experiments and analyse their results based on the gained knowledge
3. Developing students' teamwork skills

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

Knowledge:

1. define the basic physics concepts within the scope of the curriculum relevant to the field of study and give simple examples of their applications in the surrounding world - [K_W01, K_W02]
2. formulate and explain the fundamental physics laws within the scope of the curriculum relevant to the field of study, determine their basic limitations and the scope of their applicability - [K_W02]
3. give examples of the application of the basic physics laws to describe the phenomena in the surrounding world - [K_W02]
4. explain the aim and significance of simplified models to describe physical phenomena - [K_W01]

Skills:

1. apply the basic laws of physics and simplified models to solve simple problems within the scope of the curriculum relevant to the field of study - [K_U01]
2. perform qualitative and quantitative analysis of the results of simple physics experiments - [K_U08]
3. formulate simple conclusions based on the results of calculations and experiments/measurements - [K_U08]
4. use with understanding the recommended sources of knowledge (recommended bibliography) and to acquire knowledge from other sources - [K_U01]
5. plan and carry out the standard measurements of basic physics phenomena, identify and evaluate the importance of basic measurement noise/disturbance factors - [K_U07]

Social competencies:

1. actively engage in solving problems, independently develop and broaden their skills - [K_K01]
2. cooperate in a team, carry out their responsibilities assigned as a part of teamwork, demonstrate responsibility for their own work and the responsibility for the results of the team - [K_K03]
3. follow the fundamental ethical principles - [K_K05]

Assessment methods of study outcomes

Learning outcome (symbol)	Assessment method	Marking criteria			
		2	3	4	5
W01	Exam: written/ oral	up to 50.0%	50.1%-70.0%	70.1%-90.0%	from 90.1%
W02	Exam: written/ oral	up to 50.0%	50.1%-70.0%	70.1%-90.0%	from 90.1%
W03	Exam: written/ oral	up to 50.0%	50.1%-70.0%	70.1%-90.0%	from 90.1%
W04	Exam: written/ oral	up to 50.0%	50.1%-70.0%	70.1%-90.0%	from 90.1%
U01	Test	up to 50.0%	50.1%-70.0%	70.1%-90.0%	from 90.1%
U02	Laboratory report				
U03	Laboratory report				
U04	Exam: written/ oral, laboratory report				
U05	Laboratory report				
K01	Activity assessment during classes and laboratory				
K02	Assessment of the laboratory assignment				

Course description

The program of the course contains following topics:

Introduction to classical physics. Harmonic oscillator. Wave motion ? waves in elastic media. Special theory of relativity. Relativistic mechanics. The electric and magnetic field. Charges and conductors in electric and magnetic fields. Maxwell?s equations. Electromagnetic waves. Interaction of light with matter. Physical optics ? interference, diffraction, polarization.

Introduction to quantum physics. Quantum nature of radiation. Wave properties of particles. Heisenberg?s uncertainty principle. Schrodinger?s equation adopted to hydrogen atom. Interpretation of quantum numbers.

Basic bibliography:

1. 1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN Warszawa 2003
2. 2. K.Jezierski, B.Kołodka, K.Sierański, Fizyka. Zadania z rozwiązaniami t 1-2, Oficyna Wydawnicza Scripta, Wrocław ?
3. 3. St.Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007

Additional bibliography:

1. 1. J.Masalski, Fizyka dla inżynierow t.1-2, WNT Warszawa 1980
2. 2. K.Łapsa, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2008
3. 3. B.M. Jaworski, A.A. Dietław ? Fizyka ? przewodnik encyklopedyczny, PWN 1998.3. B.M. Jaworski, A.A. Dietław ? Fizyka ? przewodnik encyklopedyczny, PWN 1998.

Result of average student's workload

Activity	Time (working hours)

1. participating in classes (lectures): 45h ?	45
2. participating in classes (practical activities)	15
3. participating in classes (laboratory assignments):	45
4. preparing for classes: 6 x 3h	18
5. preparing for the final test:	6
6. preparing for laboratory assignments: 12 x 2h	24
7. preparing (at home) laboratory reports: 12 x 2h	24
8. participating in course consultations: 3 x 1h	3
9. preparing for the final exam and attendance at the exam: 12h + 3h	15
10. Total student?s workload is:	205

Student's workload

Source of workload	hours	ECTS
Total workload	205	7
Contact hours	0	0
Practical activities	0	0