STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Physics		**1010334111010330037**
Field of study	Profile of study (general academic, practical)	Year /Semester
Automatic Control and Robotics	**(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	**part-time**	
No. of hours		No. of credits
Lecture: **46** Classes: **16** Laboratory: **-** Project/seminars: **-**		**8**
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		**100 8%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Fundamental knowledge of physics and mathematics [PRK 4]
2	**Skills**	Skills in solving elementary problems in physics based on the knowledge possessed, ability to extract information from the recommended sources [PRK 4]
3	**Social competencies**	Understanding of the necessity of extending their competences, readiness to cooperate within a team [PRK 4]

Assumptions and objectives of the course:

1. Transfer of fundamental knowledge in physics, within the range defined by the program relevant for the field of study
2. Development of skills in solving elementary problems based on the knowledge possessed

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

Knowledge:

1. student can define basic physical concepts, within the range covered by program relevant for the field of study, and indicate simple examples of their application in the surrounding world - [K_W02 (P6S_WG)]]
2. student can formulate and explain fundamental physical laws, within the range covered by program relevant for the field of study, define general restrictions and the range of their applicability, give examples of their application in phenomena in the surrounding world - [K_W02 (P6S_WG)]]
3. student can explain the aim and meaning of simplified models in description of physical phenomena - [K_W02 (P6S_WG)]]

Skills:

1. student can use, with understanding, the recommended sources of knowledge (basic references list), as well as gain knowledge from other sources - [K_U01 (P6S_UU)]]

Social competencies:

1. student can get actively involved in solving problems stated, develop and extend his (her) competences unaided - [K_K01 (P6S_KK)]]

Assessment methods of study outcomes

Lectures : written exam in test form
3.0: 50.1%-60.0%
3.5: 60.1%-70.0%
4.0: 70.1%-80.0%
4.5: 80.1%-90.0%
5.0: from 90.1%

Classes : , written test, activity at auditory classes
3.0: 50.1%-60.0%
3.5: 60.1%-70.0%
4.0: 70.1%-80.0%
4.5: 80.1%-90.0%
5.0: from 90.1%

Course description

1.Classical mechanics
- classification of the modes of motion
- kinematics and dynamics of translatory motion (including: laws of dynamics, conservation laws for energy and momentum)
- kinematics and dynamics of rotary motion (including: laws of dynamics, conservation law for angular momentum)
- harmonic oscillations ? simple and driven (including: resonance phenomenon)
- mechanical waves
- gravity interactions

2.Fundamentals of special relativity
3.Thermodynamics
- temperature, 0 thermodynamics law
- heat and mechanical work, I thermodynamics law
- elements of kinetic theory of gases
- entropy, II thermodynamics law

4.Electromagnetism
- electrostatics (including: Gauss law)
- electric current
- magnetostatics (including: Ampere's law)
- electromagnetic induction (including: Faraday's law)
-electromagnetic waves (including: energy and momentum, polarization)

5.Optics
- geometrical optics (including: reflection and refraction laws)
- wave optics (including: interference and diffraction)

6.Fundamentals of quantum physics
- quantum nature of light
- wale properties of matter
- elementary problems of atomic structure

7.Elements of modern physics (short review)
- selected problems in atomic, solid state, nuclear and elementary particle physics

Basic bibliography:

1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki t 1-5, PWN Warszawa 2003
2. K.Jezierski, B.Kołodka, K.Sierański, Fizyka. Zadania z rozwiązaniami t 1-2, Oficyna Wydawnicza Scripta, Wrocław
3. J.Kalisz, M.Massalska, J.M.Massalski, Zbiór zadań z fizyki, część I i II, Wydawnictwo Naukowe PWN, Warszawa 1987

Additional bibliography:

1. J.Masalski, Fizyka dla inżynierow t.1-2, Wydawnictwa Naukowo-Techniczne, 2006
2. Paul A. Tipler, Ralph A. Llewellyn, Fizyka współczesna, Wydawnictwo Naukowe PWN, 2011

Result of average student's workload

Activity	Time (working hours)

1. Lectures	46
2. Classes	16
3. Consultations	4
4. Preparation for classes	40
5. Preparation for the final colloquium	40
6. Preparation for exam	60
7. Exam	4

Student's workload

Source of workload	hours	ECTS
Total workload	210	8
Contact hours	70	2
Practical activities	0	0