STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Physics		**1010331421010410037**
Field of study	Profile of study (general academic, practical)	Year /Semester
Information Engineering	**(brak)**	**1 / 2**
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: **2** Classes: **-** Laboratory: **1** 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		**5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Any student attending the lectures should have a basic knowledge in physics and mathematics at the secondary school level.
2	**Skills**	He/she should be able to solve elementary problems of physics and those problems of engineering, that need in their solution a basic knowledge of physics. Students should also know, how to find necessary information needed for the solution.
3	**Social competencies**	He/she must be honest, responsible, creative, well mannered and behave with dignity.

Assumptions and objectives of the course:

1. Presentation of the basic knowledge in physics at the high school level in fields of: mechanics, thermodynamics, electrodynamics and quantum physics. The presentation will indicate how the knowledge allows one to understand the physical principles of functioning of some simple technical devices.
2. Presentation of the power of the simulation technique in solving basic problems of physics and enineering.
3. Presentation of such a way of looking at the surrounding world that allows us to understand it in terms of the laws of nature.
4. Creation of a scientific image of the Universe, in particular in its cosmological aspects.

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

Knowledge:

1. Integrated into a coherent whole knowledge of the basic branches of physics that allows one to understand of the physical basis of simple technical devices. - [-]
2. Detailed knowledge of selected branches of physics needed to understand digital technology. - [-]

Skills:

1. Ability to analyze the physical foundations of the simple technical devices. - [-]
2. The ability to expand the knowledge of the universe on the basis of information about new scientific discoveries. - [-]

Social competencies:

1. The student will understand the role that a university graduate will play in society. - [-]

Assessment methods of study outcomes

The written examination checking the knowledge acquired during the lectures, and in particular utility in the analysis of simple technical devices.

Course description

Classical mechanics discussed in the context of simple physical phenomena and principles of modern technical equipment such as the space shuttle.

The theory discussed in the context of the movement of the masses in the universe, in particular the solar system and the Earth's artificial satellites.

Oscillatory motion discussed eg. in the context of musical instruments.

Wave motion - waves in elastic and liquid media.

Acoustic elements discussed in the context of the human auditory system.

Thermodynamics discussed in the context of the operation of the engines, including automotive, insulation and digital processors.

Blackbody radiation discussed in the context of the cosmic microwave radiation.

Special relativity with an indication of its important role in the design of the GPS system.

Electric and magnetic field discussed in the context of e.g. the ITER tokamak.

Maxwell's equations and electromagnetic waves with particular emphasis on their relativistic aspects.

Interaction of light with matter discussed in the context of absorption colors.

Physical optics - interference, diffraction, polarization discussed in the context of interference colors and the priciples of functioning of technical equipment such as a camera.

Introduction to quantum physics - quantum nature of radiation, wave properties of particles, the Heisenberg uncertainty principle discussed in the context of historical and contemporary developements.

Basic bibliography:

1. Resnick Halliday Walker, Podstawy fizyki, tomy 1-5, PWN, 2003

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Independent work on the issues presented in lectures	60

Student's workload

Source of workload	hours	ECTS
Total workload	90	5
Contact hours	30	3
Practical activities	0	0