STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Physics		**1010331121010410037**
Field of study	Profile of study (general academic, practical)	Year /Semester
Control Engineering and Robotics	**(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: **-** Project/seminars: **-**		**2**
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		**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Fundamental knowledge of physics; basic level according to the secondary school syllabus. K_W01: Knowledge of mathematics including integration and differentiation calculus.
2	**Skills**	Ability to solve elementary problems in physics on the basis of knowledge acquired. Ability to draw information from recommended sources.
3	**Social competencies**	Understanding of the need to extend the level of competence, readiness to work in group.

Assumptions and objectives of the course:

- Presentation of fundamental knowledge of physics in the range determined by the syllabus of the subject of study.
- Development of the ability to solve simple problems, perform simple experiments and analyse/ interpret their results on the basis of the knowledge acquired.

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

Knowledge:

1. Students have fundamental knowledge in the following areas of physics mechanics, thermodynamics, optics, electricity, magnetism, selected problems of nuclear physics, selected problems of physics of condensed phase - [K_W02+++]
2. Students are able to formulate and explain the fundamental laws of physics in the range determined by the syllabus of the subject of study, are able to identify basic limitations of the laws and the range of their applications for description of phenomena in the real world - [K_W03++]

Skills:

1. Students are able to use the recommended sources of information and understand the contents (list of fundamental literature) and are able to gain knowledge from other sources - [K_U01+++]
2. Students are able to use the fundamental laws of physics and simplified models in solving simple problems in the range determined by the syllabus - [K_U06+]

Social competencies:

1. Students are able to engage in solving basic problems, are able to extend their competence on their own - [K_K01++]

Assessment methods of study outcomes

Lecture : pass on the basis of a written exam (score scale, fewer than 50% correct answers < insufficient, 50.1-60% - sufficient, 60.1-70% - sufficient plus, 70.1-80% - good, 80.1-90% - good plus, from 90.1% - very good).

Course description

1. Classical mechanics including:
- kinematics and dynamics of translational motion (laws of dynamics, law of energy and moment of momentum conservation),
- kinematics and dynamics of rotational motion (laws of dynamics, law of moment of momentum conservation),
- harmonic vibrations free and forced (including the resonance phenomenon),
- mechanical waves,
- gravitation.
2. Fundamentals of special theory of relativity.
3. Electromagnetism:
- electrostatics (including the Gauss law),
- electric current,
- magnetostatics (including the Ampere law),
- electromagnetic induction (the Faraday law),
- electromagnetic waves (energy, momentum, polarisation).
4. Optics:
- geometric optics (the law of light reflection and refraction),
- wave optics (interference and diffraction).
5. Fundamentals of quantum physics:
- quantum character of light,
- elementary problems of the structure of atom.
6. Elements of contemporary physics (selected problems).

Basic bibliography:

1. D. Halliday, R. Resnick, J. Walker, Podstawy fizyki t 1-5, PWN Warszawa 2004.

Additional bibliography:

1. J. Orear, Fizyka, WNT 1990. 2. J. Masalski, Fizyka dla inżynierów t.1-2, WNT Warszawa 1980.
2. J. Masalski, Fizyka dla inżynierów t.1-2, WNT Warszawa 1980.

Result of average student's workload

Activity	Time (working hours)
1. Exam/credit of lecture	33

Student's workload

Source of workload	hours	ECTS
Total workload	60	2
Contact hours	32	1
Practical activities	0	0