

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Some Issues in Modern Physic		Code 1010624171010424071
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty Internal Combustion Engines	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 20 Classes: 10 Laboratory: - Project/seminars: -		No. of credits 3
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 3 100%
Responsible for subject / lecturer: dr Jarosław Ruczkowski email: jaroslaw.ruczkowski@put.poznan.pl tel. 665 3228 Faculty of Technical Physics ul. Nieszawska 13A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of physics and mathematics (to the extent specified by the program contents relevant to field of study)
2	Skills	The ability to solve basic problems of physics on the basis of their knowledge, the ability to obtain information from the indicated sources
3	Social competencies	Understanding of the need to broaden their knowledge and skills
Assumptions and objectives of the course: 1. Provide students with a basic knowledge of modern physics 2. Develop students' ability to see examples of the achievements of modern physics in terms of action and construction equipment used in the modern world 3. Developing students' ability to use and understand the sources of popular scientific and popular, describing the achievements of modern physics, and their applications		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Defines the basic concepts of quantum physics - [K1A_W02] 2. Formulates and explains the basic laws of quantum physics and give examples of their use in the description of phenomena in the world around - [K1A_W02] 3. Provides simple examples of the achievements of modern physics in the operation and construction of the equipment used in the modern world - [K1A_W02]		
Skills: 1. Can apply basic laws of quantum physics and simplified models to describe phenomena in the surrounding world and the operation of selected devices, in which the achievements of quantum physics are utilized - [-] 2. Can use and understand of the indicated sources of knowledge (basic bibliography) and to acquire knowledge from other sources - [K1A_U03]		
Social competencies: 1. Can independently develop and enhance their knowledge and skills - [K1A_K01]		

Assessment methods of study outcomes

Control test.		
Course description		
1. Blackbody radiation 2. Quantum properties of radiation 3. Wave properties of matter 4. The probabilistic nature of quantum physics 5. Elements of nuclear physics 6. Lasers - The principle of operation and applications 7. Elements of solid state physics 8. Elements of nuclear physics and nuclear energy 9. Nuclear physics in medicine 10. Elements of particle physics		
Basic bibliography:		
1. D.Halliday, R.Resnick, J.Walker, Podstawy fizyki tom 5, PWN Warszawa 2006 2. P.A.Tipler, R.A.Llewellyn, Fizyka współczesna, PWN Warszawa 2012		
Additional bibliography:		
1. R.Eisberg, R.Resnick, Fizyka kwantowa, PWN Warszawa 1983 2. A.K.Wróblewski, Historia fizyki, PWN, Warszawa 2007		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	28	
2. Participation in consultations related to the implementation of the training	4	
3. Preparation for the control test	16	
4. Participation in the control test	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	50	3
Contact hours	34	2
Practical activities	0	0