STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Problems of Modern Physics		**1010602111010403493**
Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanical Engineering	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
Second-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 %)
the sciences		**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	basic knowledge of classical and quantum physics, and mathematics (to the extent specified by the content of the curriculum relevant to the field of study)
2	**Skills**	ability to solve elementary problems in physics and technology on the basis of their knowledge, the ability to acquire 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 Transfer students with knowledge of the achievements of modern physics

2 Developing in students the ability to see examples of the achievements of modern physics in the principles of operation and construction of equipment used in science and technology

3 Developing students' skills in understanding the sources of popular scientific and popular, describing the achievements of modern physics and their innovative applications

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

Knowledge:

1. define the basic concepts of quantum physics - [K2A_W03 +++]

2. formulate and clarify the fundamental laws of quantum physics and give examples of their application to the description of phenomena in the surrounding world - [K2A_W03 +++]

3. give examples of successes of quantum physics in the operation and construction of equipment used in science and technology - [K2A_W03 +++]

Skills:

1. apply the basic laws of quantum physics and simplified models to describe phenomena in the surrounding world and the actions selected devices, which are used in the achievement of modern physics - [-]

2. specify the principles for the design and operation of research facilities using the achievements of modern physics - [K2A_U09 +]

3. benefit from an understanding of the identified sources of knowledge (basic bibliography) and gain knowledge from other sources - [K2A_U02 ++]

Social competencies:

1. independently develop and enhance their knowledge and skills - [K2A_K01 +++]

Assessment methods of study outcomes
the effect of education (symbol) form of assessment criteria for evaluation W01 control test 3 50.1% -70.0% 4 70.1% -90.0% 5 from 90.1% W02 control test 3 50.1% -70.0% 4 70.1% -90.0% 5 from 90.1% W03 control test 3 50.1% -70.0% 4 70.1% -90.0% 5 from 90.1% U01 control test 3 50.1% -70.0% 4 70.1% -90.0% 5 from 90.1% U02 control test 3 50.1% -70.0% 4 70.1% -90.0% 5 from 90.1%

Course description
1. Precision spectroscopy ? ion trap and the atomic ? Rabbi method and its applications ? quadrupole spectrometer 2 Patterns of time and frequency 3 Applications of lasers in technology 4 of precision metrology equipment 5 Devices material engineering

Basic bibliography:

1. P,A.Tipler, R.A.Llewellyn, Fizyka współczesna, PWN Warszawa 2012

Additional bibliography:

1. Postępy Fizyki, http://postepy.polskie-towarzystwo-fizyczne.pl/
2. Physik Journal, http://www.pro-physik.de/phy/physik/journalHome.html

Result of average student's workload

Activity	Time (working hours)
1. Udział w wykładach	28
2. udział w konsultacjach związanych z realizacją procesu kształcenia	4
3. przygotowanie do testu kontrolnego	28
4. obecność na teście kontrolnym	2

Student's workload

Source of workload	hours	ECTS
Total workload	62	2
Contact hours	34	0
Practical activities	0	0