STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Physics		**1010311411010430037**

Field of study	Profile of study (general academic, practical)	Year /Semester
Power 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)
First-cycle studies	**full-time**

No. of hours					No. of credits
Lecture: **30**	Classes: **-**	Laboratory: **30**	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 %)

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 (program basis for high schools, basic level)
2	**Skills**	skills in solving elementary problems in physics based on the knowledge possessed, ability to extract information from the recommended sources
3	**Social competencies**	understanding of the necessity of extending one?s competences, readiness to cooperate within a team

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 and performing simple experiments, as well as the analysis of results obtained, based on the knowledge possessed
3. Development of skills in self-study and team work

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

Knowledge:

1. The student can formulate and explain fundamental physical laws, within the range covered by program relevant for the field of study, give examples of their application in phenomena - [K_W02]
2. The student has a basic knowledge of electrical metrology and measurement error analysis - [K_W05]

Skills:

1. The student can use, with understanding, the recommended sources of knowledge (basic references list), as well as gain knowledge from other sources [K_U01] - [K_U01]
2. Students can work individually and in team - [K_U02]
3. The student has the ability to self-learning - [K_U11]
4. The student can perform simple experiments, interpret the results and draw conclusions - [K_U15]

Social competencies:

1. The student is able to think and act creatively - [K_K01]

Assessment methods of study outcomes

Lecture: Examination under test consists of 8 -10 questions. The rating is based on the number of points scored (0-50% - rating 2.0; 50,1-60% - rating 3,0; 60,1-70% - rating 3,5; 70,1-80% - rating 4,0; 80,1-90% - rating 4,5; 90,1-100% - rating 5,0)

Laboratories: Credit based on oral or written response from the scope of content performed laboratory exercises and written reports. The prerequisite is to pass a minimum of 85% of the total planned for student exercises (positive assessment of the responses and reports)

Course description

Lecture:

1.Classical Mechanics: movements classification; kinematics and dynamics of movement (including laws of motion, conservation of energy, momentum, angular momentum); free and forced harmonic vibrations (including the phenomenon of resonance)

2. Elements of thermodynamics: heat transfer mechanisms, elements of kinetic theory of ideal gas

3. The gravitational field

4. The electric field and magnetic: electrostatics; electric current; magnetostatics; electromagnetic induction, Maxwell's equations

5. Wave motion: mechanical waves; the basics of acoustics; Doppler effect, electromagnetic waves; phenomena of diffraction, interference and polarization

6. Optics: geometric optics, coherence of light, laser

7. Fundamentals of quantum physics: corpuscular properties of light; wave properties of matter; elementary aspects of atomic structure

Laboratory:

The student performs 13-14 exercises of various section of physics

List of subjects laboratory

1. Determination of density of solids and liquids using pycnometer and Jolly's weight.
2. Determination of gravity acceleration using a reversible and mathematical pendulums
3. Determination of stiffness modulus using dynamic method
4. Determination of Young's modulus using deflection method
5. Determination of the sound speed in air using phase shift method
6. Determination of the linear expansion coefficient of solids
7. Study of uniformly accelerated motion using a computer-measuring kit
8. Determination of temperature dependence of the viscosity coefficient
9. Determination of ferromagnetic hysteresis loop using hallotron
10. Determination of temperature dependencies of conductivity for semiconductor and conductor
11. Determination of electromotive force of cell using compensation method
12. Determination of the capacitor's capacitance using oscillation method
13. Marking thermocouples
14. Determination of Planck's constant and the output work based on the photoelectric effect
15. The measurement of e /m ratio
16. The studies of the electrodynamic force.
17. Determination of the refractive index using the smallest deviation angle method in the prism
18. Determination of the diffraction grating's constant.
19. Determination of the focal length of the lens
20. The studies of spectra using a spectroscope
21. Determination of the radius of curvature of the lens by means of the Newton rings
22. Examination of torsion of polarization's plane by the solutions using a polarimeter
23. Determination of the liquid's refractive index using an Abbe refractometer
24. Determination of luminous efficacy of selected light sources

Basic bibliography:

1. D. Halliday, R. Resnick, and J. Walker, Fundamentals of Physics, John Wiley & Sons Ltd, 2004

2. R. Feynman , R. Leighton , and M. Sands, The Feynman Lectures on Physics (online edition), The Feynman Lectures Website, September 2013.

Additional bibliography:

1. . S. Szuba, Ćwiczenia laboratoryjne z fizyki, Wydawnictwo Politechniki Poznańskiej, Poznań 2007

Result of average student's workload

Activity	Time (working hours)
1. Lecture	30
2. Laboratory	30
3. Consultations	4
4. Preparation of written reports	30
5. Preparation to laboratory	30
6. Preparation to exam	26

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	150	5
Contact hours	65	0
Practical activities	30	0