

<b>Subject code</b>	<b>Credits</b>
FIZ1016	4

**Title**

BENDROJI FIZIKA

**Title in English**

GENERAL PHYSICS

**Subject goal and annotation**

The course is designed to provide fundamental physical knowledge about physical phenomena that takes place in nature and technology. The course emphasis will include understanding principles of science, methods of doing science, development of inquiry skills related to practical situations including applications. Special attention will be paid to the understanding of physical phenomena used for multimedia and internet: acoustics, geometrical optics, quantum physics etc. At the end of this course students will be able to understand principles how the things and stuffs around us work and to use them for the needed applications.

**Prerequisites**

General mathematics

**Relationship between the learning outcomes of the Programme and learning outcomes of the subject**

Learning outcomes of the Programme	Learning outcomes of the subject	Criteria for measuring the achievement of learning outcomes
1. Knowledge and understanding of basic mathematics, physics and nature, and its applicability in engineering.	Understanding of basic physical ideas in following areas: mechanics, thermal physics, electricity, magnetism, optics, acoustics, solid state physics, quantum physics, atomic and subatomic physics. Conduction of experiments employing physical laws, analysis and interpretation of the experimental data.  Ability to apply basic physical knowledge for the analysis of important present topics: climate and nuclear energy.	Student is able to describe manifestation of physical phenomena and point out their causes.  Student is able to use simple physical devices for measuring physical quantities, can statistically analyze obtained data and present results. Is able to explain the reasons of climate change and to describe the physical basis of nuclear energy safety.
19. Fast and efficient adaptation to the quickly changing cultural, economical and technological environment.	Understand of the impact of scientific and engineering solutions in a global and societal context.	Student demonstrates skills to analyze critically the impact of science and engineering for sustainable human being as well as understanding of the development of technologies.

**Subject content**

	Lecture topics and contents	Hours
1.	Physics as experimental science. Physical measurements and errors	3
2.	Kinetics and dynamics	3
3.	Mechanical energy, work, gravitation.	3
4.	Oscillations, waves and elements of acoustics.	3
5.	Basic principles of the thermodynamics	3
6.	Heat physics.	3

7.	Electrostatic field.	3
8.	Direct current.	3
9.	Magnetic field.	3
10.	Nature of light and the laws of light propagation	3
11.	Interaction between light and materials	3
12.	Basic principles of quantum physics	3
13.	Elements of the solid state physics	3
14.	Subatomic particles	3
15.	Nuclear reactions and radiation	3
	<b>Total</b>	<b>45</b>

### Practical work contents

During the course student will have to perform and defend six laboratory works:

1. Investigation of the relationship between mass of the body and its movement.
2. Measurement of the speed of ejected ball by ballistic pendulum.
3. Measurement of the thermal expansion coefficients.
4. Analysis of the interaction forces between two point charges.
5. Verification of the laws of the light reflection and refraction.
6. Measurements of the characteristics of lenses: focal length, magnification and spherical aberrations.

### Evaluation of study results

Final written exam (50%), mid-term written exam (17%), and assessments of laboratory (practical) work (33%).

### Distribution of subject study hours

Lectures	45
Laboratory work	15
Individual studies (including studies in groups, preparation for the mid-term and final exams)	44
<b>Total</b>	<b>104</b>

### Recommended literature

No	Authors of publication and title	Number of copies available		
		<i>in the Library of VMU</i>	<i>in specialized publication collections at VMU</i>	<i>in other libraries</i>
<b>Basic materials</b>				
1.	A. Bogdanovi ius. Fizikos pagrindai in0inerijoje. Technika. 2010	1	5	20
2.	A. Kanapickas. Bendroji fizika, paskait konspektas. VDU. 2011	First class server		
3.	Fizika biomedicinos ir fizini moksl studentams. VDU leidykla. 2004	7	3	40
4.	A. Tamazauskas. Fizika. Mokslas 1987	50	2	150
<b>Supplementary materials</b>				
1.	V. Ambrasas, B. Jasiulionis. Mechanika, molekulin fizika ir termodinamika. Technologija. 2009			
2.	V. Ambrasas, B. Jasiulionis. Fizika: elektromagnetizmas. Technologija. 2006			
3.	I. Po0 la, . Radvilavi ius. Optika ir atomo fizika. Technologija. 2007			

### Subject prepared and coordinated by

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