Subject code	ECTS credits
FIZ1016	4

Course title in Lithuanian

BENDROJI FIZIKA

Course title in English

GENERAL PHYSICS

Short course annotation in Lithuanian (up to 500 characters)

Kurso metu didelis dėmesys skiriamas pagrindinių mokslo principų ir mokslo vystymosi metodų supratimui bei praktiniam žinių panaudojimui užduočių sprendimui. Atskirai bus akcentuojami fizikiniai reiškiniai ir dėsniai, kurie yra taikomi multimedijos ir interneto technologijose: akustika, spindulinė optika, kvantinė fizika ir kt. Baigę kursą, studentai supras ir gebės taikyti pagrindinius fizikos dėsnius kasdieninėse situacijose.

Short course annotation in English (up to 500 characters)

The course emphasise the understanding principles of science, methods of doing science, development of inquiry skills related to practical situations and applications. Special attention is 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 and apply the general physical principles for daily situations.

Prerequisites for entering the course

Mathematical Analysis 1, Mathematical Analysis 2, Mathematical Analysis 3

Course aim

The aim of the course is to provide fundamental physical knowledge about physical phenomena that takes place in nature and technology together with ability to apply physical knowledge for the analysis of important present topics.

Links between course outcomes, criteria of learning achievement evaluation, study methods and methods of learning achievement assessment

No	Course outcomes	Criteria of learning achievement evaluation	Study methods	Methods of learning achievement assessment
1	Understanding of basic physical ideas in following areas: mechanics, thermal physics, electricity, magnetism, optics, acoustics, solid state physics, quantum physics, atomic and subatomic physics.	Student is able to describe manifestation of physical phenomena and point out their causes.	Lectures Laboratory (practical) works;	Mid-term and final exam written tests; assessment of laboratory (practical) work report and its verbal defence
2	Conduction of experiments employing physical laws, analysis and interpretation of the experimental data.	Student demonstrates skills to use simple physical devices for measuring physical quantities, can statistically analyze obtained data and present results. Based on the experimental results student can recognise qualitative trends and quantitative relationships between related physical quantities.	Laboratory (practical) works	Assessment of laboratory (practical) work report and its verbal defence
3	Ability to apply basic physical knowledge for the analysis of important present topics such as	Is able to explain the reasons of important present topics such as climate change or nuclear energy safety (particular topic selection	Lectures and active discussions on actual	Mid-term and final exam written tests

	climate change, nuclear energy and others.	can vary according to the national/global actualities present at the course timeframe)	topics from physical point of view	
4	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.	Lectures and active discussions on actual topics from physical point of view	Mid-term and final exam written tests

Links between study programme outcomes and course outcomes

Study programme outcomes	Running number of course outcome					
	1	**2**	**3**	**4**	**5**	**6**
Know and comprehend concepts and propositions of fundamental mathematical subjects, recognize and apply them solving practical/theoretical tasks	+	+	+	+		
Having good foundations of mathematics, logically and critically recognize and describe relations between quantities of real life and mathematical concepts	+	+	+	+		
Work individually and/or in groups by developing and adopting appropriate mathematical models and tools for use in case analysis		+	+	+		

Content

No	Content (topics)
1.	Physics as experimental science. Physical measurements and errors
2.	Kinetics and dynamics
3.	Mechanical energy, work, gravitation.
4.	Oscillations, waves and elements of acoustics.
5.	Basic principles of the thermodynamics
6.	Heat physics.
7.	Electrostatic field.
8.	Direct current.
9.	Magnetic field.
10.	Nature of light and the laws of light propagation
11.	Interaction between light and materials
12.	Basic principles of quantum physics
13.	Elements of the solid state physics
14.	Subatomic particles
15.	Nuclear reactions and radiation

Distribution of workload for students (contact and independent work hours)

Lectures	**45**
Laboratory work	**15**
Individual students work	**60**
Total:	**120**

Structure of cumulative score and value of its constituent parts

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

Recommended reference materials

No				Number of copies in

	Publication year	Authors of publication and title	Publishing house	*University library*	*Self study rooms*	*Other libraries*
Basic materials						
1	2010	A. Bogdanovičius. Fizikos pagrindai inžinerijoje.	Technika	1	5	20
2	2011	A. Kanapickas. Bendroji fizika, paskaitų konspektas.	VDU	VDU moodle server		
3	2004	Fizika biomedicinos ir fizinių mokslų studentams.	VDU	7	3	40
4	2015	Aleksėjus Bogdanovičius. Fizikos pagrindai savarankiškoms studijoms	VGTU		1	
Supplementary materials						
1	2010	Sunil Mukhi, N. Mukunda. Lectures on advanced mathematical methods for physicists.	World Scientific	Access through electronic library		
2	2012	Jo Hermans. Physics in daily life	EDP Sciences	Access through electronic library		

Course programme designed by

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