Information sheet for the course: Selected Chapters from Physics I

University: Alexander Dubček University of Trenčín

Faculty: Faculty of Industrial Technologies in Púchov

Course unit code: PP-P-9 | **Course unit title:** Selected Chapters from Physics I

Form, scope and method of educational activity:
Form of study: Lecture / Seminar / Laboratory tutorial
Recommended number of lessons (hours):
Weekly: 2 / 1 / 2 **During the semester:** 24 / 12 / 24 **Method of study:** attendance method

Number of credits: 5

Recommended semester: 2.

Degree of study: The 1st degree of study

Course prerequisites: -

Assessment methods:
Assessment during the semester:
Summary assessment of work results during the semester = 40 points
Active participation in calculation exercises and lectures. It is evaluated by continuous scoring of independent, correct or original solutions to physical problems raised in a teacher-moderated professional discussion. Successful completion of the course is conditional on the development and internal defense of all laboratory measurement protocols.

Final assessment:
Assessment of exam results = 60 points
The exam consists of a written and an oral part.

Grading scale:
Grade A: 91 – 100 points
Grade B: 81 – 90 points
Grade C: 71 – 80 points
Grade D: 61 – 70 points
Grade E: 55 – 60 points
Grade FX: less than 55 points

Learning outcomes of the course unit:
The student has basic knowledge of classical physics in the context of the current physical picture of the world and to the extent necessary for the successful study of technical subjects. He knows the connections between the fundamental properties of the Universe, the structure of matter, the composition of substances and the nature of various forms of physical movement. He understands the mathematical formalism of classical physics, can formulate the basic laws of classical mechanics and apply them in solving simple model problems. He is able to cooperate in a creative team in the implementation of planned physical experiments, measurements, processing, evaluation and presentation of the obtained results.

Course contents:
Introduction to the study of physics, the Nobel Prize for physics in the current year, international achievements of Slovak physics, the importance of the study of physics for material sciences.
A short history of the Universe and its current cosmological models, fundamental properties. Universe, matter, space, time, space-time, dark matter, structure of matter.
Paradigms of contemporary physics, classical physics, quantum physics, Copenhagen interpretation of quantum physics, quantum entanglement, multiverse theory, practical aspects of quantum physics.
The standard model of particles and forces, the www-protocol and the Internet as a by-product of the study of the structure of matter at the LHC in Cern.
Atomic theory, evolution, ISS, space expeditions, man's position in the Universe.
Movement and its forms, mechanical movement and its description, determination of position, relativity of position and movement.

Kinematics of a mass point, change of position, speed, acceleration, thrust and its use in CNC machine tools.
Kinematics of a system of material points, center of gravity, foundations of the Special Theory of Relativity and its practical consequences, GPS navigation system and the theory of relativity.
Dynamics of a mass point, mass, momentum, inertia, force, force impulse.
Newton's laws of motion, energy, effect, work, performance.
Gravitational law, special types of movements, cosmic speeds, space flights.
Dynamics of a system of material points and a rigid body.
Laws of conservation and symmetry.

Recommended of required reading:

FEYNMAN, R.: The Feynman Lectures on Physics I-III, California Institute of Technology-Addison Wesley Longman, 1970. ISBN-10: 0201021153.
YOUNG, H.D., FREEDMAN, R.A.: University Physics, Addison-Wesley, New York, 1996.
KITTEL, CH.: Thermal Physics, Acad. Press, NewYork-London, 1997.
HAWKING, S.: Ilustrovaná stručná história času, Slovart, Bratislava, 2004. ISBN: 978-80-8085-920-6.
WEIS, Š.: Všeobecná fyzika I, Alfa, Bratislava-Praha, 1986.
KREMPASKÝ, J.: Fyzika, Alfa, Bratislava, 1982.
E-learning TnUAD.

Language:
English

Remarks:
Compulsory course

Evaluation history: 0
Total number of graded students:

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Lecturers: doc. Mgr. Ivan Kopal, PhD., Ing. Daniela Koštialiková, PhD.

Last modification: 31.08.2022

Supervisor: doc. Ing. Ján Vavro, PhD.