

Information sheet for the course: Selected Chapters from Physics II

University: Alexander Dubček University of Trenčín	
Faculty: Faculty of Industrial Technologies in Púchov	
Course unit code: PP-P-16	Course unit title: Selected Chapters from Physics II
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: 6	
Recommended semester: 3.	
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 the classical theory of electromagnetism in the context of the current physical picture of the world and to the extent necessary for successfully mastering the study of technical subjects. He understands the mathematical formalism of classical electrodynamics, can formulate the basic laws of electromagnetism and apply them in solving simple model problems. He can cooperate in a creative team in the implementation of planned physical experiments, measurements, automated processing of experimental results using computer technology, their evaluation and presentation.	
Course contents:	
Introduction to the theory of electromagnetism, corpuscular-wave nature of elementary particles, quantum nature of the microworld.	
Standard model of particles and forces.	
Mathematical foundations of the theory of vector fields.	
Electrical properties of material objects. Electric charge, electrostatic field, Coulomb's law. Intensity, potential and energy of the electrostatic field.	
Comparison of electrostatic and gravitational fields, movement of material objects in electric and gravitational fields.	
A formal analogy between electric and gravitational fields and fundamental differences between them.	
Conductor in an electric field, electrostatic induction, electric dipole, conductor capacity, capacitor capacity and energy.	
Technological devices using an electrostatic field.	
Electric field at the interface of two environments.	

Electric current, Ohm's law, electromotive voltage.
Modern electrical and electronic devices. Open issues of electromobility.
Kirchhoff's laws, work and power of electric current, current possibilities and perspectives of electricity production.
Magnetic field, basic laws of magnetism, alternating electric current.
Maxwell's theory of electromagnetic field, electromagnetic radiation, light, laser as a device and model of qualitative changes.
The search for a unified theory of interactions.

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, New York-London, 1997.

HAWKING, S.: Ilustrovaná stručná história času, Slovart, Bratislava, 2004. ISBN: 978-80-8085-920-6.

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 Košťaliková, PhD.

Last modification: 31.08.2022

Supervisor: doc. Ing. Ján Vavro, PhD.