Fire University of Warsaw, Poland
Faculty of Security Engineering and Civil Protection
Syllabus 2018 -

Physics

profile	general academics
degree	first degree
programme	ERASMUS
semester	1
part time / full time	full time
ECTS	5
coordinator	dr inż. Jan Bihałowicz

form of the activity: exercise

hours	30
prerequisites	The student should have a mastery of high school physics and mathematics.
objectives	To learn the basics of classical and quantum physics and physical modeling. To gain knowledge of the applications of physics in technology, especially technology related to fire protection and technical rescue. To gain basic knowledge of physics for studying other subjects, to develop the ability to apply the laws of physics to solve practical problems, to develop the ability to apply the knowledge gained to solve tasks independently.
methods	Excercises
own work	Study of the literature, study of the indicated issues, preparation for the exam.
basic literature	1. Halliday, D., Resnick, R. and Walker, J. (2014) Fundamental of Physics. 10th Edition, Wiley and Sons, New York.
supplementary literature	1. Feynman, Richard P. (Richard Phillips), 1918-1988. The Feynman Lectures on Physics. Reading, Mass. :Addison-Wesley Pub. Co., 19631965.

contents	hours
Velocity and acceleration. Principles of dynamics. Dynamic equations of motion of a point. Progressive motion and rotational motion of a rigid body. Plane motion of a rigid body, instantaneous axis of rotation. Inertial and non-inertial systems.	6
Periodic motion, harmonic motion, damped oscillatory motion, forced oscillation. Wave motion, energy relations in wave motion.	4
Electric field. Gauss's law. Magnetic field of current. Ampere's law. Electromagnetic waves.	6
Reflection, refraction, diffraction, interference and polarization of light. Dispersion and absorption of electromagnetic waves. Elements of quantum mechanics.	2
Elements of thermodynamics. Blackbody radiation. Elements of statistical physics.	6

Structure of matter - elementary particles. Atomic nuclei. Natural and artificial radioactivity.	4
Solid state physics.	2

form of the activity: exercise

hours	30
prerequisites	The student should have mastered knowledge of physics and mathematics from high school.
objectives	Objectives To become familiar with the fundamentals of classical and quantum physics and physical modeling. To gain knowledge of the applications of physics in technology, especially technology related to fire protection and technical rescue. To acquire basic knowledge of physics for studying other subjects, to develop the ability to apply the laws of physics to solve practical problems, to develop the ability to apply the acquired knowledge to solve tasks independently.
methods	Performing laboratory exercises
own work	Own work development of the results of laboratory exercises, report writing
basic literature	1. J. Rybiński, S. Elbanowska, W. Szypuła, M. Bednarek, Laboratorium fizyczne, SGSP, Warsaw 2000.
supplementary literature	1. Ifan Hughes, Thomas Hase Measurements and their Uncertainties: A practical guide to modern error analysis

contents	hours
Optics: refraction, atomic spectra, wave phenomena, geometric optics	10
Heat and molecular physics: specific heats, molar heat, radiation,surface tension	10
Nuclear physics: radiation absorption, radiation statistics	6
Measurements and their uncertainties	4

form of the activity: exercise

hours	30
prerequisites	The student should have a mastery of high school physics and mathematics.
objectives	To learn the basics of classical and quantum physics and physical modeling. To gain knowledge of the applications of physics in technology, especially technology related to fire protection and technical rescue. To gain basic knowledge of physics for studying other subjects, to develop the ability to apply the laws of physics to solve practical problems, to develop the ability to apply the knowledge gained to solve tasks independently.
methods	Lecture
own work	Study of the literature, study of the indicated issues, preparation for the exam.
basic literature	1. Halliday, D., Resnick, R. and Walker, J. (2014) Fundamental of Physics. 10th Edition, Wiley and Sons, New York.
supplementary literature	1. Feynman, Richard P. (Richard Phillips), 1918-1988. The Feynman Lectures on Physics. Reading, Mass. :Addison-Wesley Pub. Co., 19631965.

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