

(Table 5.2) Course unit description

Study program: Physics			
Type and level of studies: Undergraduate academic studies			
Course unit: Molecular physics with thermodynamics			
Teacher in charge: Momir Arsenijevic, assistant professor			
Language of instruction: English			
ECTS: 8			
Prerequisites: /			
Semester: summer semester			
Course unit objective Basic principles of statistical physics, phenomenological thermodynamics and physics of mechanical waves			
Learning outcomes of Course unit Students will be trained to be able to follow higher courses in physics.			
Course unit contents Statistical Physics and Thermodynamics, Mass and Size of Molecules, State of a System. Process, Internal Energy of a System, The First Law of Thermodynamics, Work Done by a Body upon Changes in Volume, Empirical Temperature, Equation of State of an Ideal Gas, Internal Energy and Heat Capacity of an Ideal Gas, Equation of Adiabatic of an Ideal Gas, Polytropic Processes, Work of an Ideal Gas in Different Processes, Van der Waals Gas, The Barometric Formula, Information from the Theory of Probability, Nature of the Thermal Motion of Molecules, Number of Collisions of Molecules with a Wall, Pressure of a Gas on a Wall, Mean Energy of Molecules, The Maxwell Distribution, Experimental Verification of the Maxwell Distribution law, The Boltzmann Distribution, Determination of the Avogadro Constant by Perrin, Macro- and Microstates. Statistical Weight, Entropy, Fundamental Laws of Thermodynamics, The Carnot Cycle, The Thermodynamic Temperature Scale, Examples of Calculating the Entropy, Some Applications of Entropy, Propagation of Waves in an Elastic Medium, Equations of a Plane and a Spherical Wave, Equation of a Plane Wave Propagating in an Arbitrary Direction, The Wave Equation, Velocity of Elastic Waves in a Solid Medium, Energy of an Elastic Wave, Standing Waves, Oscillations of a String, Sound, The Velocity of Sound in Gases, The Doppler Effect for Sound Waves			
Literature 1. I. V. Savelyev, <i>Physics: A General Course Vol I & Vol II</i> , Mir Publishers, Moscow, 1989 2. I. E. Irodov, <i>Problems in general physics</i> , Mir Publishers, Moscow, 1988			
Number of active teaching hours			Other classes:
Lectures: 56	Practice:	Other forms of classes: mentoring system for small groups of students	
Independent work: 42			
Teaching methods			
Examination methods (maximum 100 points)			
Exam prerequisites	No. of points	Final exam	No. of points
Practical classes		Written examination	
Tests		Oral examination	50
Homework	50	Other	
Seminars			
Project			
Grading system			
Grade	No. of points	Description	

10	≥ 91	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing
5	≤ 50	Failing