



УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA
ПРИРОДНО-МАТЕМАТИЧКИ ФАКУЛТЕТ
FACULTY OF NATURAL SCIENCES AND MATHEMATICS



CHEMISTRY DEPARTMENT

FIRST CYCLE OF STUDY

Chemistry/Chemistry Education

Course name	Physical Chemistry 1			
Course code	Course status	Semester	Hours of instruction	ECTS
1C16HOS397	required	V	3+3	7
Teacher(s)	prof. dr Dijana Jelić PhD			

Prerequisite course(s)	Entry requirements
General Chemistry, Inorganic Chemistry, Physics 1	passed

Course goals

The aim of the course in Physical Chemistry 1 is the theoretical and experimental study of different forms of matter and connecting their microscopic and macroscopic properties. Chemical thermodynamics is the basis for understanding all disciplines studied in the field of physical chemistry, such as chemical kinetics, electrochemistry, colloid chemistry, biophysical chemistry. Knowledge of the laws of thermodynamics, of thermodynamic functions is acquired, and on the basis of energy changes, the conditions that determine the direction of a spontaneous chemical reaction and its range are defined.

Learning outcomes

After completing the course Physical Chemistry 1, the student knows how to apply the kinetic theory of gases and connect the macroscopic and microscopic properties of gases. Student can calculate and explain energy changes that occur in all three aggregate states, understand the concept of thermodynamic functions of enthalpy, entropy and Gibbs free energy and can define the state of the system based on given thermodynamic functions.

Course content

State of matter. Gas, liquid and solid aggregate state. Thermodynamics. First law of thermodynamics, heat, work, internal energy, enthalpy. Second law of thermodynamics, Carnot cycle, entropy, Statistics. Affinity of chemical reactions. Helmholtz, Gibbs energy, spontaneous reaction and equilibrium, Maxwell relations.

Experimental part:

Measurements of heat of physical and chemical changes, viscosity, surface tension

Teaching methods

Lectures, calculation exercises, laboratory exercises,

Books and other learning materials

N. Čegar, J. Penavin-Škundrić, B. Škundrić, Osnovi hemijske termodinamike, Banjaluka, 2006; I.D. Holclajtner Antunović, Opšti kurs fizičke hemije, Zavod za udžbenike i nastavna sredstva, Beograd, 2000; D. Malešev, Odabrana poglavlja fizičke hemije, Farmaceutski fakultet, Beograd, 2003; P. W. Atkins, Physical Chemistry, Oxford, University Press; M. Juranji, Fizička hemija, Zbirka riješenih zadataka, Univerzitet u Novom Sadu 1998.

Course activities and grading method

Laboratory exercises are obligated for taking the exam. Two tests (theory and calculation – 51%). First test from matter of state, second test is chemical thermodynamics. Oral exam.

Laboratory	10	Test - theory	15
Test - calculations	15	Final exam	60

Additional course notes

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Name of the teacher who prepared this form | Prof. dr Dijana Jelić, PhD