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	General Chemistry			
Course code	**Course status**	**Semester**	**Hours of instruction**	**ECTS**
1C16HOS425	required	I	3+2	7
Teacher(s)	**Prof. Zora Levi PhD**			

Prerequisite course(s)	**Entry requrements**
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Course goals

The aim of this course is to teach students basic chemical concepts that will enable them to successfully follow other more complex chemical disciplines. The goal is for students to develop a creative approach to chemical problems that will enable them to understand changes within chemical compounds.

Learning outcomes

The student knows the basic chemical laws and the structure of atoms and molecules. Understands the connection of the periodic table of elements with the electronic configuration and can define and apply the values of ionization energy, electronic affinity and electronegativity coefficients. The student understands the principles and differences of chemical and intermolecular bonds and further applies them in real systems: acids, bases and buffers. The student understands and knows the basic concepts of chemical kinetics, catalysis, thermochemistry and electrochemistry.

Course content

Introduction (How it all started, States and classification of mater, Physical and chemical properties of matter, Measurement). Atoms, molecules and ions (Early ideas about atoms and evolution of atomic theory, Electromagnetic energy and Bohr model of atoms, Development of quantum theory and electronic structure of atoms - electronic configurations, Periodicity of properties and Periodic table of elements, Atomic structure and symbolism, Chemical formulas, Molecules and ions, Chemical nomenclature, Basic chemical laws, Mass and mole concept). Basic concepts of thermochemistry (Heat and chemical reactions, Enthalpy, Calorimeter). Chemical bond and geometry of molecules (Ionic bond, Covalent bond, Lewis structures and symbols, Formal charge and resonance, Valence bond theory, Hybrid atomic orbital, Multiple bonds, Molecular orbital theory, Metal bond, Intermolecular bonds, Chemical bond strength and intermolecular bonds). Chemical kinetics (The rate of a Reaction, Factors influencing the rate, Reaction mechanisms, Catalysis). Acids and Bases (Theories of acids and bases, pH and pOH, Acid and base Strength, Salt hydrolysis, Buffers, Acid-base titrations, Indicators and pH measurement). Electrochemistry (Redox chemistry, Galvanic cells, Electrolysis). *Experimental exercises*: Safety measures and work techniques in a chemical laboratory. Basic measurements (temperature, mass, volume, density ...). Basic work techniques (mixing, titration, distillation). Basic methods of separation and isolation (filtration, distillation). PH measurement.

Teaching methods

Lectures and laboratory exercises

Books and other learning materials

Z. Levi and J. Penavin Škundrić: **General Chemistry** (in Serbian), TF UNIBL - Banja Luka 2014. N. Perišić Janjić: **General Chemistry** (in Serbian), Science, Belgrade, 1997; I. Filipović and S. Lipanović: **General and Inorganic Chemistry** (in Croatian), Part I and II, Školska knjiga, Zagreb 1995. R. Chang: General Chemistry: The Essential Concepts, 4th edition, The Mc Graw - Hill Comp., Inc., New York, 2006. Internal practicum for laboratory exercises (in Serbian).

Course activities and grading method

The colloquium and the activity refer to the laboratory practicum and are a condition for taking the final exam. Tests: two per semester. The results of these tests are included in the final grade only if they exceed 50% of the points provided for a given form of test during the semester.

Colloquium and activity	**20**	Test 2	**10**
Test 1	**10**	Final exam	**60**

Additional course notes

Name of the teacher who prepared this form	Saša Zeljković

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