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| **Subject**   | **General and inorganic chemistry**   |
| **Type**   | **Semester**  | **ECTS**  | **Cod**  |
|  **O**   | **1**  |  **6**  |   130ICH102 |
| **Course Lecturet**  | Prof. Asst. Dr. Gani Kastati |
| **Course Assistant**  | MSc. Berat Durmishi |
| **Course Tutor**  |  |
| **Aims and Objectives**  | In the course of general and inorganic chemistry, students must gain knowledge about the basics of chemistry as a natural science, the structure of matter, the atomic-molecular theory (basic laws of chemistry), the periodic system of elements, the structure of the atom, the clarification of the electronic structure of the atom according to the quantum theory, the mechanical wave theory on the structure of the atom, chemical bonds and molecular structure, ionic bonding and covalent bonding, metallic bonding, properties of solutions, the theory of acids and bases, types of chemical reactions, the basics of thermodynamics and chemical kinetics, chemical balance (with special emphasis on the chemical balance in aqueous solutions) and acid-base indicators, hydrolysis, buffers, redox reactions. Important inorganic chemical elements in food and that: primary bioelements such as: hydrogen, oxygen, carbon, nitrogen, phosphorus, sulfur, secondary bioelements such as: magnesium, calcium, iodine, etc. As well as toxic elements such as: lead, cadmium, arsenic, etc.   |
| **Learning outcomes**    |  ***After completing this course (subject), the student will be able to:***  • Acquired knowledge on the basics of chemistry as a natural science (chemical matter/substance), chemical changes, changes of matter and energy, basic laws of chemistry. • Gain knowledge about the structure of the atom, the electronic structure and the arrangement of chemical elements in the periodic system in accordance with the laws of the periodic system of elements. • To become familiar with the concepts of the formation of chemical bonds in homoatomic and heteroatomic molecules. • Distinguish between oxides, acids, bases and salts, • To have knowledge about the types of chemical reactions, as well as To become familiar with the role and importance of chemical elements in food technology.   |
| **Alignment of Course’s Learning Outcomes to Programs Learning Outcomes.**    | 1. ***Application of theoretical knowledge:***

 * To possess and understand advanced knowledge in general and inorganic chemistry.
* To gain knowledge about pure substances and mixtures, chemical symbols and formulas, to differentiate between chemical symbols and formulas. To know chemical equations as abbreviated expressions of chemical reactions. Distinguish atomic and molecular masses, valence, and the amount of substance - mole.
* To gain knowledge about the structure of the atom, the electronic configuration of the atom, atomic orbitals and their shape, quantum numbers.
* To gain general knowledge on the basic laws of chemistry such as: Law of Lavoisier, Law of Proust, Law on multiple relationships of masses, Dalton's Hypothesis on atoms, Avogadro's Law.
* Periodic system of elements, Triads of Debrejner, Octaves of Newlands and periodic system of Mendeleev. Ionization energy, Electronegativity. The structure of molecules. Chemical bonds. Ionic bond and covalent bond.

 ***2.Development of practical skills*** * To classify inorganic compounds, oxides, nonoxygenic acids and oxygenic acids, bases and salts and to know their importance.
* To distinguish acid-base indicators, their role and importance in chemical reactions, and to know how to distinguish between neutralization and hydrolysis reactions.
* To address and solve problems related to the determination of elements in food products. To distinguish primary bioelements from secondary ones and to know the negative role of toxic elements in food products.

 ***Engage in continuous learning, staying up-to-date with the latest trends, challenges and innovations in the field of general and inorganic chemistry, as a special and important entry-level course in food science.***   |
| **Content**    | ***Content of Lectures/Weekly Plan***   | ***Week***  |
| Introduction: Pure Substances and Mixtures, Chemical Symbols and Formulas, Atomic and Molecular Masses, Valence, Chemical Equations, Amount of Substance - Mole   | 1  |
| The structure of the atom, the electronic configuration of the atom,   | 2  |
| Atomic orbitals and their shape, quantum numbers.   | 3  |
| The Basic Laws of Chemistry – Lavoisier's Law, Proust's Law, Law on Multiple Relationships of Masses, Dalton's Hypothesis on Atoms, Avogadro's Law.   | 4  |
| Periodic system of elements, Triads of Debrejner, Octaves of Newlands and periodic system of Mendeleev. ionization energy, Electronegativity;   | 5  |
|  The structure of molecules. Chemical bonds. Ionic bond and covalent bond.   | 6  |
| Seminar presantion  | 7  |
| Classification of inorganic compounds, Oxides, Nonoxygenic acids and oxygenic acids.   | 8  |
| Bases and salts (neutral, acidic, basic salts, double salts, hydrated salts and complex salts.   | 9  |
| Acid - basic indicators, Neutralization and Hydrolysis   | 10  |
| Ionic product of water, pH value and buffer solutions - acidic buffers and basic buffers.   | 11  |
| Oxido-reduction reactions. Equation of redox equations.   | 12  |
| Chemical elements, Separation, Primary, secondary bioelements and toxic elements. The role and importance of primary bioelements: Hydrogen, Oxygen, Carbon, Nitrogen, Phosphorus. Secondary bioelements: sodium, potassium, magnesium, calcium, iodine, calcium, etc. and toxic elements: lead, cadmium, arsenic, etc.   | 13   |
| Presentation of case studies  | 14  |
|   | Final assesment  | 15  |
| **Literature/ References**  | * *Suzana Aliu, Fidan Feka & Gani Kastrati: Kimi e pergjithshme dhe inorganike ,  për studentët e shkencave të  ushqimit dhe teknologjisë, studentët e agrokulturës dhe inxhinjerisë së mjedisit, studentët e farmacisë, UBT - Prishtinë 2023.*
* *Azem Lajci , Vuksan Kalaj: KIMIA,per studentet e Mjekesise, stomatologjise dhe Biologjise;  Universiteti i Prishtines, Prishtine 1998.*
* *Filipović, S. Lipanović: Kimia e pergjitheshme dhe inorganike  pjesa I& II.  Školska  knjiga, Zagreb, VIII. izdanje, 1991; perkthyer ne shqip nga Xhavit Ahmeti , Prishtine, 1996.*
* *Xon V. Hil , Ralf H. Petru~i, Teri V. Mekkriri, Skot S. Peri: Kimia e pergjitheshme, Perkthyer nga Qeveria e RM –se Tabernakul, 2011.*
* *Wikibooks.org GeneralChemistry* [*http://www.gnu.org/copyleft/fdl.html 2013*](http://www.gnu.org/copyleft/fdl.html%202013)*.*
* [*Darrell Ebbing*](https://www.google.com/search?client=firefox-b-d&sa=X&sca_esv=571565668&biw=1536&bih=739&tbm=bks&tbm=bks&q=inauthor:%22Darrell+Ebbing%22&ved=2ahUKEwiu-vX0kuSBAxUhSfEDHVG5B24Q9Ah6BAgJEAc)*, ‎*[*Steven D. Gammon*](https://www.google.com/search?client=firefox-b-d&sa=X&sca_esv=571565668&biw=1536&bih=739&tbm=bks&tbm=bks&q=inauthor:%22Steven+D.+Gammon%22&ved=2ahUKEwiu-vX0kuSBAxUhSfEDHVG5B24Q9Ah6BAgJEAg) · *Basic general chemistry book.* 2016

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