Study program: PHARMACY

Type and level of studies: Integrated academic studies, Level 1/2

**Course unit: GENERAL AND INORGANIC CHEMISTRY**

**Teacher in charge: Prof. Dr. Ratomir M. Jelic**

Language of instruction: ENGLISH

ECTS: 9

Prerequisites: Preknowledge of secondary school chemistry

Semester: WINTER SEMESTER

**Course unit objective: Acquiring the basic knowledge and skills of atomic and molecular structure and of chemical changes, chemical bonds, general properties of solutions, general features of the reactions and the main parameters which affect these properties, elements of thermodynamics and kinetic as well as understanding the chemistry of elements and their compounds together with the laws of chemical periodicity.**

**Learning outcomes of course unit:**

Knowledge and understanding basic terms in the field of general and inorganic chemistry:

- physical properties of a substance, substance state and changes, pure substance – mixture, elements – compounds, atoms – molecules, chemical formulae – reactions, stoichiometry laws, a mole unit, and calculations with concentrations and other chemical quantities, atomic structure, chemical bonding, gases, liquids, and solids, properties of solutions, electrolytes, thermochemistry and electrochemistry, chemical equilibrium, chemical kinetics, acids and bases, inorganic chemistry fundamentals and nomenclature, general properties and reactions of representative elements and their important compounds.

Acquiring knowledge and skills with all important stoichiometry calculations and with experimental skills in a chemical laboratory, in relation with certain general chemistry contents.

**Course unit contents**

*Theoretical classes*

A short introduction to the development of chemistry. Matter and energy. The laws of stoichiometry. Models of atomic structure. Electronic configuration and the periodic system of elements. Chemical bonds and theories of chemical bonds. Intermolecular interactions. State of matter and aggregate states. Laws of ideal gas behavior. Types of chemical reactions. Oxidation-reduction equations. Energy changes in chemical reactions. Basic thermochemical laws. Basic types and properties of inorganic compounds. Coordination compounds. Basic concepts: central atoms, ligands, stability, biological importance. Disperse systems. Solutions and quantitative composition of solutions. Colligative properties of the solution. Chemical kinetics. Chemical equilibrium. Electrolytes. Acids and bases. Equilibria in electrolyte solutions. Ionic product of water. pH value of the solution. Buffers and the role of buffers in the body. Equilibria in heterogeneous systems. Hydrolysis.

Chemistry of the elements of the periodic system: elements in nature, main applications, properties of elements, important compounds, and their application in pharmacy.

*Practical classes*

Chemical calculations and practical work in a chemical laboratory, in relation with certain general chemistry contents.

**Literature**

- С. Трифуновић, Т. Сабо, З. Тодоровић, Општа хемија, Хемијски факултет, Београд, 2014.
- Р. Јелић, Неорганска хемија – за студенте фармације, Факултет медицинских наука, Крагујевац, 2016.
- Р. Јелић, Практикум из опште и неорганске хемије, Факултет медицинских наука, 2016.
- Ralph H. Petrucci, F. Geoffrey Herring, Jeffry D. Madura, Carey Bissonnette, General Chemistry, Principles and Modern Applications, TENTH EDITION, Pearson Canada Inc., Toronto, Ontario, 2011.
- Donald Cairns, Essentials of Pharmaceutical Chemistry, Third edition, Pharmaceutical Press, USA, 2008
- Н. Глинка, Задаци и вежбе из опште и неорганске хемије, Научна књига, Београд, 1994.

| **Number of active teaching hours** | | | | **Other classes** |
|---|---|---|---|---|
| Lectures:<br>60 | Practice:<br>30 | Other forms of classes: | Independent work:<br>180 | |

**Teaching methods: Lectures, practice in a clinic, clinical problems solving**

**Examination methods (maximum 100 points)**

| **Exam prerequisites** | **No. of points:** | **Final exam** | **No. of points:** |
|---|---|---|---|
| Student's activity during lectures | **30** | oral examination | **70** |
| practical classes/tests | | written examination | |
| Seminars/homework | | | |
| Project | | | |
| Other | | | |

| **Grading system** | | |
|---|---|---|
| **Grade** | **No. of points** | **Description** |
| **10** | **95-100** | **Excellent** |
| **9** | **85-94** | **Exceptionally good** |
| **8** | **75-84** | **Very good** |
| **7** | **65-74** | **Good** |
| **6** | **55-64** | **Passing** |
| **5** | **< 54** | **Failing** |

**Course unit description**