

Course code	Course group	Volume in ECTS credits	Course hours
BBK 1002	C	6	160

Course type (compulsory or optional)	Compulsory
Course level (study cycle)	Bachelor
Semester the course is delivered	Spring
Study form (face-to-face or distant)	Face-to-face

#### Course title in Lithuanian

NEORGANINĖ IR BIONEORGANINĖ CHEMIJA

#### Course title in English

INORGANIC AND BIOINORGANIC CHEMISTRY

#### Short course annotation in Lithuanian (up to 500 characters)

Supažindinama su neorganinės ir bioneorganinės chemijos teoriniais pagrindais ir įgyjami praktiniai gebėjimai atliekant neorganinių junginių sintezę. Pateikiamos žinios apie *s*, *p*, *d* ir *f* elementų ir jų junginių fizikines ir chemines savybes, ryšį tarp elementų atomų struktūros ir periodinės elementų lentelės, gyvybiškai svarbius neorganinius elementus.

#### Short course annotation in English (up to 500 characters)

The course provides fundamental knowledge in inorganic and bioinorganic chemistry and practical skills performing basic knowledge of inorganic synthesis. The course includes topics as the physical and chemical properties of *s*, *p*, *d* and *f* elements and their compounds; the relationship between atomic structure and the periodic table; the importance of inorganic elements for plant, animal and human life.

#### Prerequisites for entering the course

General chemistry.

#### Course aim

To provide knowledge in theoretical basic of chemical elements, inorganic and bioinorganic compounds.

#### Links between course outcomes and criteria of learning achievement evaluation

Course outcomes	Criteria of learning achievement evaluation
1. To explain the relationship between the structure of atoms and periodical table of elements.	Student will be able to explain the relationship between the structure of atoms and periodical table of elements.
2. To describe the typical properties of <i>s</i> , <i>p</i> elements and their compounds.	Student will be able to describe the typical properties of <i>s</i> , <i>p</i> elements and their compounds.
3. To describe the typical properties of <i>d</i> , <i>f</i> elements and their compounds.	Student will be able to describe the typical properties of <i>d</i> , <i>f</i> elements and their compounds.
4. To identify and to describe the main biogenic elements.	Student will be able to identify and to describe the main biogenic elements.
5. To describe the bioinorganic compounds and their importance for the living organism.	Student will be able to describe the bioinorganic compounds and their importance for the living organism.

#### Content (topics)

1. Classification and nomenclature of inorganic compounds.
2. Electronic structure of elements atom. Periodicity of elements properties.
3. <i>s</i> elements – hydrogen, elements of IA and IIA groups, the physical and chemical properties of main their compounds.
4. Elements of III A and IV A groups, their extraction, physical and chemical properties. The chemical properties of IIIA and IVA group elements compounds.
5. V A group elements, their extraction, physical and chemical properties. The chemical properties of VA group elements.

6. Elements of VI A, VII A and VIII A groups, their extraction, physical and chemical properties. The chemical properties of VI A, VII A and VIII A group elements compounds.
7. The general characteristic of III B, IV B, VB, VI B and VII B group elements.
8. The chemical properties of V B, VIB and VII B group elements compounds.
9. Elements of VIII B group, their extraction, physical and chemical properties. The chemical properties of VIII B group elements compounds. Corrosion process.
10. The general characteristic of <i>f</i> -elements.
11. Biogenic elements. The distribution of chemical elements in the cell.
12. Macro- and microelements. The importance of microelements for human organism. The role of metal ions in cells.
13. Metal ion transport and storage. Metal-containing electron transfer proteins
14. Alkaline metals and their distribution in organism. Sodium and potassium ions in the organism, their biological effect. The biological effect of calcium and magnesium ions.
15. Oxygen transport and transport proteins.

#### **Distribution of workload for students (contact and independent work hours)**

Lectures - 45 hours, practical works - 30 hours, consultations, individual work (including preparation for practical works, mid-term and final exams) - 85 hours.

#### **Structure of cumulative score and value of its constituent parts**

Final assessment sums the assessments of written final examination (50%), written mid-term examination (20%), auditorial work (15%) and assessment of laboratory works (15%).

#### **Recommended reference materials**

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	Self-study rooms	Other libraries
<i>Basic materials</i>						
1.	1995	Janickis V. Bendroji ir neorganinė chemija (General and inorganic chemistry).	Mokslo ir enciklopedijų leidykla	45	2	
2.	2008	Žarnauskas A. Neorganinės chemija (Inorganic chemistry)	Technology	3	1	
<i>Supplementary materials</i>						
3.	2000	Massey A. G. Main group chemistry	Wiley			
4.	2010	E.Crabb, E.Moore and L.Smart. Concepts in transition metal chemistry	Cambridge			
5.	1999	Sharpe A.G. Inorganic chemistry	Longman			
6.	1994	W. Kaim, B. Schewederski. Bioinorganic chemistry. Inorganic elements in the chemistry of life	John Wiley&Sons			

#### **Course programme designed by**

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