



**SYLLABUS**  
«Inorganic Chemistry»

**Degree of Higher Education - Master**  
**Specialty 211 Veterinary Medicine**  
**Educational professional program - no**  
**Year of training – the first; Semester: 1**  
**Learning form – full-time**  
**Amount of the ECTS credits 4**  
**Language of instruction - English**

**Supervisor**  
**Supervisor's contact**  
**information (e-mail)**  
**eLearn Course URL**

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<https://elearn.nubip.edu.ua/enrol/index.php?id=668>

**DESCRIPTION OF COURSE**

The discipline studies the theoretical foundations of contemporary Inorganic Chemistry and data about features of bio-elements such as Hydrogen, Halogens, Oxygen, Sulfur, Nitrogen, Phosphorus, Carbon, Tin, Lead, Boron, Aluminum, Alkaline and Alkaline-earth metals, Manganese, Iron, Cobalt, Nickel, Copper, Zinc, Molybdenum, Silver, Mercury, Cadmium, Chromium. Chemical processes with these elements and its compounds are shown on the points of view theory of electrolytic dissociation, hydrolysis, redox processes and possibility of complex compound formations. In the labs it is shown the foundations of qualitative tests of mentioned above compounds of bio-elements and its using in the practice of veterinary medicine.

**STRUCTURE OF COURSE**

Chapter	Hours (lectures/labs)	Results of learning	Tasks	Grading, scores
<b>The fall semester, the 1<sup>st</sup> year of study</b>				
<b>Module the 1<sup>st</sup>. The Foundations of Inorganic Chemistry</b>				
<b>Chapter 1.</b> Subjects and objects of the inorganic chemistry for veterinary medicine. The main concepts of atomic-molecular study	2/2	<b>To know</b> the safe rules in chemical laboratory; classification of the inorganic substances; stoichiometric chemical laws; types of chemical reactions; relations of the chemical transformations and veterinary practice. <b>To know how</b> to organize the working place and realize the lab techniques of semimicro tube tests; to work with educational literature and to organize own independent study. <b>To understand</b> the importance of the chemistry as a science about principles of the Universe existing and development; the criticism of chemophobia.	Introduction testing Lab test tube experiment – properties of the main classes of inorganic substances Control test	<b>10</b>
<b>Chapter 2.</b> Atomic structure	4/6	<b>To know</b> the modern theory of atomic structure; structure of	Module control test	<b>5</b>

and chemical bonding. The Periodical Law and Mendeleev Periodical Table of the Chemical elements		<p>electron shells; the dual properties of an electron; the mechanism of the chemical bonding of atoms one with other; concept of valence and oxidation number of an atom as a function of the outer electron shell composition.</p> <p><b>To have skills</b> to determine the possible valencies and oxidation numbers of the elements based of their electron configuration; to calculate type of chemical bonding based of electronegativity; to determine the metallic or non-metallic or metalloid properties of chemical elements.</p> <p><b>To understand</b> the correlation of chemical properties (e.g., solubility in water or non-aqua solvents) of compounds and the structure of their electron configuration and type of chemical bonding.</p>	Elern testing	
<b>Total 1<sup>st</sup> module</b>	<b>6/8</b>			<b>15</b>
<b>Module the 2<sup>d</sup>. Chemical transformations without change of oxidation degree/valency</b>				
<b>Chapter 1.</b> Expression of Concentration; recalculations of concentration units. Preparation of solutions. Acid-base chemistry of water solutions. Hydrolysis of salts.	4/18	<p><b>To know</b> the content and math expression of the basic concentration units; the nature of chemical transformations in water solutions (electrolytic dissociation, hydrolysis); a concept of a pH.</p> <p><b>To know how</b> to determine a pH of a medium; to regulate a pH using buffer solutions; compile an ionic equation; to predict the pathway of the chemical interaction in solutions; to use dissociation constant of electrolytes in Ostwald's dilution Law; to influence of ionic composition in body fluids using electrolytic drinks;</p> <p><b>To have skills</b> of acid-basic indicators application of a pH measuring; how to prepare of solutions of a taken concentration.</p> <p><b>To understand</b> how to apply the concentration units at veterinary practice.</p>	Lab test tube experiments. Volumetric determination of the temporary water hardness. Module control tests Elern testing	<b>18</b>

Total 2 <sup>d</sup> module	4/18			18
<b>Module the 3<sup>d</sup>. Chemical transformations changing oxidation degree/valency</b>				
<b>Chapter 1.</b> Theory and practice of RedOx processes	2/4	<p><b>To know</b> the concept of redistribution of electrons at RedOx transformations; typical reduction and oxidating agents among inorganic substances; influence of a pH into RedOx processes; the quantitative parameters of RedOx processes (electrode potential, EMF).</p> <p><b>To understand</b> the methodology of a product predicting for RedOx reactions based on electronegativity of elements; function the chemical source of electricity.</p> <p><b>To apply</b> the method of electron balancing;</p> <p><b>To know how</b> to act the disinfectant agents (e.g., free chlorine, ozone, hydrogen peroxide);</p> <p><b>To have practical skills</b> in realization of redox processes between typical inorganic RedOx agents.</p>	Lab test tube experiments. Module control testing. Elern testing	12
<b>Chapter 2.</b> Complex compounds.	2/4	<p><b>To know</b> the concept of Verner's Theory of Complex compounds; donate (coordinative) chemical bonding in formation of complex compounds; stability constant; isomerism, biological activity of complex compounds, including the anticancer drugs; bioinorganic systems as complex compounds.</p> <p><b>To have skills</b> of compilation of reaction equations with complex compounds; realization of qualitative tests used complex compounds;</p> <p><b>To understand</b> the concept of multidental ligands and their using in medicine practice (e.g., ferrioin, DisodiumEDTA).</p>	Lab test tube experiments. Module control testing. Elern testing	10
<b>Chapter 3.</b> The chemical properties of the main bio-active elements and their inorganic	1/11	<b>To know</b> the correlation of electron structure of the chemical elements and their chemical properties; the main acid-basic and RedOx properties of Hydrogen,		15

compounds		<p>Halogens, Oxygen, Sulfur, Nitrogen, Phosphorus, Carbon, Tin, Lead, Boron, Aluminum, Alkaline and Alkaline-earth metals, Manganese, Iron, Cobalt, Nickel, Copper, Zinc, Molybdenum, Silver, Mercury, Cadmium, Chromium and their compounds;</p> <p><b>To have skills</b> of application of the different acid-base and RedOx agents in veterinary practice;</p> <p><b>To understand</b> the concept of human and animal endemic diseases as the results of the abnormal distribution of the chemical elements in the environment.</p>		
<b>Total the 3<sup>d</sup> module</b>	<b>5/19</b>			<b>37</b>
<b>Total</b>				<b>70</b>
<b>Exam</b>				<b>30</b>
<b>Finally</b>				<b>100</b>

### EVALUATION POLICY

<b><i>Deadline policy and exam retake allowing:</i></b>	Works that are submitted in violation of deadlines without good reason are evaluated at a lower grade. Retake of tests takes place with the lecturer's permission if there are good reasons (for example, student was sick and has the hospital sheet).
<b><i>Academic Integrity Policy:</i></b>	Write-offs during tests and exams are prohibited (including using mobile devices).
<b><i>Attendance Policy:</i></b>	Attendance is a mandatory component of the grade for which points are earned. For objective reasons (such international internship, sickness), teaching may be provided on-line, in agreement with the Dean.

### GRADING SYSTEM

Rating of Higher education applicant, scores	National grade according to the results of written examination	
	exam	test
90-100	Excellent	Pass
74-89	Good	
60-73	Satisfactory	
0-59	Unsatisfactory	Fail