Course: GENERAL CHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: Forming students' mastering of basic concepts and laws of chemistry, basic laws based on the periodic law, chemical bond, the theory of oxidation and reduction reactions; acquisition of skills in the chemical lab when performing pilot experiments on solving basic practical tasks and tasks of different complexity.

Tasks of the course: Formation of strong fundamental knowledge without which the study of following sections of chemistry is impossible, including in-depth study of the theory of chemical phenomena, regularities of chemical processes. Mastering the techniques of solving chemical tasks. Consolidation of theoretical knowledge by practical sessions, which are conducted in a laboratory classes. Teaching students to work independently through various forms of individual tasks. Teaching students learn the material meaningfully and analytically, to acquire skills to analyze facts independently and draw conclusions. Finally - students should be able to make predictions of properties and processes, based on knowledge of complex patterns.

Contents of the course:

1. Atomic molecular theory. Basic laws of chemistry. The main classes of inorganic compounds.
2. Structure of the atom. Mendeleev's Periodic law and periodic system of elements
3. Chemical bond. Intermolecular interactions.
4. Energy of chemical reactions. Chemical kinetics. Chemical equilibrium.
5. Solutions. The theory of electrolytic dissociation.
6. Oxidation-reduction reactions. Galvanic element.

Teaching Staff: Kusyak N.V., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 6 ECTS credits, 180 hours total – 18 weeks, 10 hours a week.

Assessment: current assessment (17), module control (4), final exam

Course: INORGANIC CHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: formation of the future teachers' of chemistry assimilation of a system of basic concepts and laws of chemistry, basic laws based on the periodic law, chemical bond, the theory of oxidation-reduction reactions; acquisition of skills in the chemical lab when performing pilot experiments on solving basic practical tasks and tasks of different complexity.

Tasks of the course: formation of strong fundamental knowledge without which the study of following sections of chemistry is impossible. First of all it requires in-depth study of the theory of chemical phenomena, regularities of chemical processes. Consolidation of theoretical knowledge by practical sessions, which are conducted in a laboratory classes and where students are directly acquainted with many of the substances, they heard about at the lectures or read in the textbooks, study their properties. At the same time, students learn the skills of chemical ware, chemical equipment, methods of precipitation, filtration, distillation, evaporation, calcination, weighing etc.

Contents of the course:

1. Elements VI A - Subgroup.
2. Elements V A – Subgroup.
3. Complex compounds.
4. Elements IV A – Subgroup.
5. Elements I-III A – Subgroup.
6. d - Elements. Elements III - V B – Subgroup
7. Elements VI B group.
8. Elements VII B group.
9. Elements VIII A and B groups.
10. Elements I –II B group.

Teaching Staff: Kusyak N.V., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 10 ECTS credits, 300 hours total – 18 weeks, 17 hours a week.

Assessment: current assessment (51), module control (5), final exam

Course: ANALYTICAL CHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: to consolidate, deepen and expand basic theoretical concepts and practical skills that students receive on the courses of General and Inorganic Chemistry. Also to prepare future teachers to conduct classes, laboratory and practical work in higher educational institutions of the I-II levels of accreditation, in colleges, gymnasiums, classes with intensive study of chemistry, elective and other extracurricular activities with students of urban and rural schools.

Tasks of the course: questions of the mechanism and conditions of analytical reactions, theoretical foundations of separation methods and determination of the elements, classical chemical methods of analysis, as they are an important part of both theoretical and practical training of teacher of chemistry, physical and physicochemical methods and techniques of separation and concentration. Forming skills with an analytical balance, preparation of solutions of exact concentrations and their determination, dissolution, precipitation, qualitative reactions to ions that are essential in the study of some following disciplines of chemical and biological cycles, and while working at the school.

Contents of the course:

1. Law of mass action and equilibrium in solutions.
2. Law of mass action and heterogeneous systems.
3. Redox processes and process of chelation.
4. Basic methods of quantitative analysis. Methods of acid-base titration.
5. Methods of redox titration.
6. Methods precipitation titration and trilonometry
7. Gravimetric methods.
8. Chemical composition and general characteristics of the environmental objects.
9. Features of the chemical analysis of the environment.

Teaching Staff: Kychkyruk O.Yu., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 9 ECTS credits, 270 hours total – 17 weeks, 16 hours a week.

Assessment: current assessment (49), module control (5), final exam

Course: STRUCTURE OF MATTER
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: Systematic presentation of patterns of changes in the properties of substances depending on the structure of micro-particles that form them.

Tasks of the course: generate knowledge of atomic structure and chemical bonding; generate knowledge about the structure of matter in different states of aggregation: gaseous, liquid and crystalline; to form an idea about the general principles of structure; acquire the ability to establish bonds of crystal structure and chemical nature of interaction of atoms; acquire the ability to establish the bonds of the crystal structure and physical and chemical properties of crystalline materials

Contents of the course:

1. Structure of the atom.
2. Chemical bonding. Van der Waals forces.
3. State of aggregation. Band theory of the crystalline state.

Teaching Staff: Kusyak N.V., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 3 ECTS credits, 90 hours total – 17 weeks, 6 hours a week.

Assessment: current assessment (17), module control (1), credit test

Course: PHYSICOCHEMICAL RESEARCH METHODS
Status: compulsory course
Year of study, semester: the second year of study, the 4th semester

The aim of the course: familiarization with modern methods of analysis of substances and their use to solve specific practical problems.

Tasks of the course: study the theoretical foundations, chemical, physical and physicochemical methods of analysis which we deal with in processes of development; improving and daily performance of various analyses of objects of human activity and environment; scientific justification of general issues when choosing and developing methods of determining the chemical composition of substances; their concentration, separation and identification.

Contents of the course:

1. Spectral analysis methods.
2. Electrochemical methods of analysis.
3. Methods for separation and concentration.

Teaching Staff: Gorbyk P.P., Doctor of Physical and Mathematical Sciences, Professor at the Department of Chemistry, Kusyak A.P., Assistant at the Department of Chemistry.

Course length: 3 ECTS credits, 108 hours total – 18 weeks, 6 hours a week.

Assessment: current assessment (4), module control (3), credit test

Course: ORGANIC CHEMISTRY
Status: compulsory course
Year of study, semester: the second and third years of study, the 4^{th} and 5^{th} semesters

The aim of the course: study of the main classes of organic compounds, their structure, methods of obtaining, properties and areas of application.

Tasks of the course: students obtain knowledge of organic compounds, their classification, structure and reactivity, acquire skills in chemical lab.
Contents of the course:

1. Introduction. The structure and reactivity of organic compounds.
2. Isolation, purification and structure determination of organic compounds.
3. Aliphatic hydrocarbons.
4. Organic compounds containing Halogen.
5. Organic compounds containing Nitrogen.
6. Organic compounds containing Oxygen.
7. Bifunctional compounds.
8. Carbohydrates.
9. Alicyclic hydrocarbons.
10. Benzene and its functional derivatives.
11. Polycyclic and non-benzene-based aromatic compounds.
12. Heterocyclic compounds.
13. Organization and security of work in the lab of organic synthesis.
14. Chemical principles of organic synthesis.Mechanisms and conditions of performing reactions.
15. Synthesis of organic compounds by electrophilic and nucleophilic substitution.
16. Condensation, oxidation and restoration of organic compounds.

Teaching Staff: Lystvan V. M., PhD in Chemistry, Associate Professor at the Department of Chemistry. Lystvan V. V. PhD in Chemistry, Associate Professor at the Department of Chemistry, Yanovych I.V., PhD in Chemistry, Senior Lecturer at the Department of Chemistry.

Course length: 16 ECTS credits, 576 hours total – 34 weeks, 17 hours a week.

Assessment: current assessment (4,5), module control (16), final exam

Course: PHYSICAL AND COLLOID CHEMISTRY
Status: compulsory course
Year of study, semester: the second year of study, the 3^{d} and 4th semesters

The aim of the course: to consolidate, deepen and expand basic theoretical concepts, practical skills and skills obtained by students in the courses of general and analytical chemistry; to prepare future teachers to conduct classes, laboratory and practical work in higher educational institutions of the I-II levels of accreditation, in colleges, gymnasiums, classes with intensive study of chemistry, elective and other extracurricular activities with students of urban and rural schools. Study of fundamental principles, laws and theories of physical and colloid chemistry, teach the understanding and analysis of processes and phenomena observed during chemical - manufacturing operations, physical and chemical analysis; teach methods of calculation to determine the direction of the flow of chemical processes, their energy and equilibrium; methods of experimental investigations of the properties of chemical substances and processes and analysis of experimental data, and also advanced study of the theoretical foundations of modern chemistry, formation of knowledge about the interdependence of substances, their structure and properties.

Tasks of the course: to teach students useful for the teachers skills and abilities in work with electric measuring devices, formulation and carrying out of chemical experiment, mathematical and computer processing of experimental data, explanation of the obtained results

Contents of the course:

1. General questions of physical and colloid chemistry.
2. Chemical thermodynamics and energy of chemical processes.
3. Heterogeneous phase equilibria and physical and chemical analysis.
4. Solutions.
5. Chemical kinetics and catalysis.
6. Adsorption.
7. Introduction to colloid chemistry.
8. Methods of obtaining colloidal systems.
9. Optical properties of colloidal systems.
10. Structural and mechanical properties of colloidal systems.

Teaching Staff: Chumak V.V., PhD in Chemistry, Associate Professor at the Department of Chemistry. Hvozdiyevskyy E.E., Assistant at the Department of Chemistry, Kaminski O.M., Assistant at the Department of Chemistry,
Chaika M.V., Assistant at the Department of Chemistry

Course length: 10 ECTS credits, 360 hours total – 34 weeks, 10, 5 hours a week.

Assessment: current assessment (3, 4), module control (10), final exam

Course: TECHNIQUE OF CHEMICAL EXPERIMENT AT SCHOOL
Status: compulsory course
Year of study, semester: the third year of study, the 6th semester

The aim of the course: to provide future teachers with the knowledge of equipment and operation of chemical laboratory at school, to acquire basic skills of carrying out basic demonstration experiments during chemistry course at school, to overcome fear of performance of demonstration experiments by the individualization of learning.
Tasks of the course: to provide visual familiarization of students with different classes of substances under study; to illustrate the chemical reactions of substances in the most visual form; to help future teacher to uncover genetic link of inorganic and organic substances, transitions between classes of compounds, synthesis of complex substances from simple etc.; to bring specific, conclusive facts about dependence of chemical substances on their structure and the nature of the mutual influence of atoms in molecules; to promote successful polytechnic training of future teachers; provide students with practical abilities and skills to select, plan, conduct, analyze and improve chemical experiment.
Contents of the course:

1. General questions of technique of chemical experiment.
2. Technique of demonstration chemical experiments at school in 7-9 classes.
3. Technique of demonstration chemical experiments at school in 7-9 classes. Entertaining chemistry.

Teaching Staff: Anichkina O.V., Assistant at the Department of Chemistry, Yevdochenko O.S., Assistant at the Department of Chemistry

Course length: 3 ECTS credits, 108 hours total – 17 weeks, 6, 3 hours a week.

Assessment: current assessment (6), module control (3), credit test

Course: BIOORGANIC CHEMISTRY
Status: compulsory course
Year of study, semester: the third year of study, the 5^{th} and 6^{th} semesters

The aim of the course: to obtain knowledge about the structure and chemical properties as the basis for understanding the metabolic changes and the correlation with biological functions, the most important classes of natural compounds
- carbohydrates, lipids, nucleic acids and peptides.

Tasks of the course: students ' acquisition of knowledge about structure, chemical properties and metabolic transformations of proteins, carbohydrates, lipids, nucleic acids.

Contents of the course:

1. The structure of proteins and peptides.
2. Chemical synthesis and chemical modification of proteins and peptides.
3. The biological role of proteins and peptides.
4. The nucleic acid.
5. Carbohydrates.
6. Lipids.
7. The biological membrane
8. Low molecular bioregulators.

Teaching Staff: Yanovych I.V., PhD in Chemistry, Senior Lecturer at the Department of Chemistry.
Course length: 8 ECTS credits, 288 hours total – 34 weeks, 8, 5 hours a week.

Assessment: current assessment (5,6), module control (8), final exam

Course: MACROMOLECULAR CHEMISTRY
Status: compulsory course
Year of study, semester: the third year of study, the 6th semester

The aim of the course: to obtain knowledge about main classes of macromolecular compounds, their properties and application areas.
Tasks of the course: students ' acquisition of knowledge about macromolecular compounds, their classification, specific physical and chemical properties and methods of preparation.
Contents of the course:

1. Introduction.
2. Physical and chemical properties of macromolecular compounds.
3. The preparation of macromolecular compounds.

Teaching Staff: Yanovych I.V., PhD in Chemistry, Senior Lecturer at the Department of Chemistry.
Course length: 3 ECTS credits, 108 hours total – 17 weeks, 6, 4 hours a week.

Assessment: current assessment (6), module control (3), credit test

Course: METHODS OF TEACHING CHEMISTRY
Status: compulsory course
Year of study, semester: the third and fourth years of study, the 6th and 7th semesters

The aim of the course: to provide all kinds of professional and methodical preparation of future teachers of chemistry for work at schools.
Tasks of the course: to form professional and methodical independence, to teach making methodical decisions competently when teaching chemistry to students.

Contents of the course:

1. Fundamentals of teaching chemistry.
2. Chemical experiment as the main method of teaching chemistry.
3. The general methodology of teaching chemistry.
4. Methods of studying the most important topics of chemistry course in the 7th grade of secondary school.
5. Methods of studying the most important topics of chemistry course in the 8th grade of secondary school.
6. Methods of studying the most important topics of chemistry course in the 9th grade of secondary school.
7. Methods of studying the most important topics of chemistry course in the 10-11th grades of secondary school.

Teaching Staff: Anichkina O.V., Assistant at the Department of Chemistry, Yevdochenko O.S., Assistant at the Department of Chemistry, Kondratenko O.U., Assistant at the Department of Chemistry

Course length: 7 ECTS credits, 252 hours total – 33 weeks, 7, 6 hours a week.

Assessment: current assessment (6,7), module control (7), credit test, final exam

Course: FUNDAMENTALS OF CHEMICAL TECHNOLOGY
Status: compulsory course
Year of study, semester: the fourth year of study, the 7th semester

The aim of the course: to provide students with chemical-technological preparation of highly qualified specialists, to form basic knowledge and concepts of chemical technology, to teach the most important chemical productions and chemical processes that are used in various industries.
Tasks of the course: form a system of basic chemical and technological knowledge, conceptual apparatus necessary for self-perception, understanding and assimilation of chemical and technological knowledge, understanding of the interconnection with other chemical, economic and environmental disciplines, skills of experimental work.
Contents of the course:

1. Chemical manufacturing. Processing of raw materials.
2. Preparation of raw materials and water preparation.
3. Production of sulfuric and nitric acids, ammoniac.
4. Fertilizer production.
5. Silicates production.
6. Metallurgy.
7. Electrochemical production
8. Processing of fuel. Basic organic synthesis.
9. Polymeric materials. Fundamentals of modern biotechnology.

Teaching Staff: Denysiuk R.O., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 9 ECTS credits, 324 hours total – 23 weeks, 14 hours a week.

Assessment: current assessment (7), module control (9), credit test, final exam

Course: METHOD OF SOLVING CHEMISTRY PRACTICE PROBLEMS
Status: compulsory course
Year of study, semester: the fourth year of study, the 7^{th} and 8^{th} semesters

The aim of the course: students' acquiring a certain level of professionalism and skill formation that are needed to solve computational problems in chemistry and to train students at school to solve them successfully.
Tasks of the course: provide students with knowledge about school chemistry computational tasks; develop skills needed for solving chemical problems; develop skills needed for the correct execution and design of chemical problems; prepare students for the skillful use of designations physical quantities, units CI, reference information; show logical sequence that is used in the solution of problems, develop skills to use it; develop skills of proper use of various methods of reasoning while solving; note the reasons of students' misunderstanding methods of solving problem and the ways to resolve them; to form ability to teach school students to solve chemical problems.

Contents of the course:

1. Method of solving the problems by chemical formulas and equations of chemical reactions.
2. Method of solving the problems from the topics "Solutions" and "Main classes of organic compounds."
3. Method of solving combined and complicated problems.

Teaching Staff: Yevdochenko O.S., Assistant at the Department of Chemistry, Kondratenko O.U., Assistant at the Department of Chemistry, Kucheruk S.V., Assistant at the Department of Chemistry

Course length: 3 ECTS credits, 108 hours total – 23 weeks, 4,7 hours a week.

Assessment: current assessment (7,8), module control (3), credit test.

Course: THEORETICAL BASES OF INORGANIC CHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: study, generalization and deepening students' knowledge about composition, structure and properties of inorganic substances, conditions and ways of transforming one substance to another.
Tasks of the course: deepening and generalization of fundamental knowledge about the basic properties of elements and their compounds based on the Periodic Table of Mendeleev using modern advances in the structure of matter, thermodynamics, chemical kinetics, chemical complex compounds, theory of solutions; to teach students to study material meaningfully, analytically, to acquire skills to analyze facts independently and draw conclusions.

Contents of the course:

1. General questions of the structure of matter.
2. Elements of chemical thermodynamics and kinetics, theory of solutions and redox processes.
3. Mendeleev's periodic law and periodic table of elements. Properties of elements.

Teaching Staff: Denysiuk R.O., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 3 ECTS credits, 108 hours total – 12 weeks, 9 hours a week.

Assessment: current assessment (17), module control (3), final exam.

Course: CRYSTAL CHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: provide the theoretical basis of crystal chemistry and X-ray diffraction to study the structure and composition of various chemical compounds, etc.
Tasks of the course: theoretical foundations crystal chemistry, crystal symmetry theory, the theory of scattering of X-rays by crystals.

Contents of the course:

1. Determination of symmetry elements and point of crystal on the model. Determination of simple forms of crystals (on the models).
2. Symmetry elements of discontinuous and Bravais lattice types. International nomenclature of space symmetry groups.
3. Withdrawal of the right points for low-symmetry space groups**.** Construction projections of space groups**.**

Teaching Staff: Chumak V.V., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 3 ECTS credits, 108 hours total – 12 weeks, 9 hours a week.

Assessment: current assessment (1), module control (1), final exam.

Course: CHEMISTRY EXTRACURRICULAR ACTIVITIES
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: to take into account the interests and preferences of pupils; form and further the ideas of humanization at school, because the formation of identity takes place in an active activities and communication with teachers and peers; train future teachers to strengthen cognitive interest, through which students are positive about the learning process, the tasks they perform; to overcome the contradictions that arise in connection with the creation of new curricula and programs, according to which the number of hours to study chemistry is being reduced, and an external independent evaluation of knowledge was introduced.
Tasks of the course: to provide students' understanding of theoretical foundations of extracurricular activities at the school of chemistry; to form practical skills and abilities to perform extracurricular activities with pupils after school, teach students to determine the content and methods of extracurricular activities depending on specific conditions with maximum consideration of individual characteristics of students; playing simulation extracurricular activities or their fragments based on students' scenarios.

Contents of the course:

1. Individual extracurricular activities in chemistry at secondary school.
2. Group extracurricular activities in chemistry at secondary school.
3. Mass extracurricular activities in chemistry at secondary school.

Teaching Staff: Avdieieva O.Iu., Assistant at the Department of Chemistry
Course length: 3 ECTS credits, 108 hours total – 13 weeks, 8, 3 hours a week.

Assessment: current assessment (2), module control (2), credit test.

Course: METHODS OF TEACHING CHEMISTRY IN SENIOR SPECIAL SCHOOL
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: deepening and improving the knowledge and practical skills of students to the specifics of content, forms, methods and means of teaching chemistry in specialized classes of different directions, to prepare students for organizing and carrying out chemistry lessons in specialized classes.
Tasks of the course: to form students' understanding of the concept "specialized education"; to analyze the state standard of general education, curricula, textbooks, manuals, methodical recommendations for high school; to prepare students for the consideration of cognitive and professional interests, abilities and needs of high school pupils during their schooling; to master means of forming social, communication, informational, technical and technological competence of students on pre-professional level, direct young people to future professional activity; create base of students' knowledge and skills for the next-promising links between general, secondary and professional education according to the chosen specialty.

Contents of the course:

1. The general principles of chemistry teaching in specialized schools.
2. Demonstration experiment at chemistry lessons in specialized schools.
3. Preparation and modeling fragments of lessons of different types according to the program of specialized classes (10-11th).

Teaching Staff: Romanyshyna L.M., Doctor of Pedagogical Sciences, Professor at the Department of Chemistry, Anichkina O.V., Assistant at the Department of Chemistry.
Course length: 3 ECTS credits, 108 hours total – 25 weeks, 4,4 hours a week.

Assessment: current assessment (1,2), module control (2), credit test, final exam.

Course: SOLID-STATE CHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: to form, consolidate, deepen and expand basic theoretical concepts, practical skills and skills obtained by students in the courses of general, inorganic, analytical, physical chemistry and chemical technology, and to prepare future chemists for lectures, laboratory and practical work in higher educational institutions of I-II levels of accreditation, colleges, different types of schools, in classes with intensive study of chemistry; to become familiar with the structure, synthesis methods and features of formation of solids with desired properties, interaction between solid substances and crystal processing techniques. Develop an understanding of the basic concepts that are based on such fundamental things as band theory, chemical bonding in semiconductors and their electrical, optical and thermoelectric characteristics; doping processes of donors and acceptors, diffusion phenomena and basic theory of quasi chemical reactions between defects in semiconductors: different types of defects, types of point defects and their role in determining the electrical and optical properties of semiconductors.
Tasks of the course: acquiring knowledge, abilities and skills needed to expand students' horizons and the foundations of scientific knowledge and needed for those students whose graduate (master's) works are related to semiconductors, to form a system of basic knowledge of Solid-State Chemistry, conceptual apparatus necessary for self-perception, understanding and learning, understanding of the relationship of the discipline with other chemical, economic and environmental disciplines, skills in experimental work.

Contents of the course:

1. Chemistry of natural crystals.
2. The phase and chemical equilibria in solids.
3. Semiconductor materials and their processing.

Teaching Staff: Tomashyk V.M., Doctor of Chemistry, Associate Professor at the Department of Chemistry.

Course length: 3 ECTS credits, 108 hours total – 13 weeks, 8, 3 hours a week.

Assessment: current assessment (2), module control (2), final exam.

Course: PHYSICAL AND CHEMICAL ANALYSIS
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: to form, consolidate, deepen and expand basic theoretical concepts, practical skills and skills obtained by students in the courses of general, inorganic, analytical, physical chemistry and chemical technology, and to prepare future chemists for lectures, laboratory and practical work in higher educational institutions of I-II levels of accreditation, colleges, different types of schools, in classes with intensive study of chemistry, optional and other extra-curricular classes with students of urban and rural schools.

Tasks of the course: to learn the changes in chemical equilibrium systems using physical and geometric methods; analysis of the nature of alloys formed by components, the interaction between which leads to the formation of diagrams of a certain type; establishing regularities of the structure of state diagrams, depending on the positions of the components in Mendeleev's periodic system.

Contents of the course:

1. Regularities of the structure of state diagrams. One-component system.
2. Two-component systems. Triple systems

Teaching Staff: Horbyk P.P., Doctor of Physical and Mathematical Sciences, Professor at the Department of Chemistry

Course length: 1,5 ECTS credits, 54 hours total – 13 weeks, 4,1 hours a week.

Assessment: current assessment (2), module control (2), final exam.

Course: THE USE OF INNOVATIVE TECHNOLOGIES IN TEACHING CHEMISTRY
Status: elective course
Year of study, semester: the fifth year of study, the 10 semester

The aim of the course: to form a relationship of theoretical knowledge and practice of modern school teacher, mastering the technology of teaching chemistry, the formation of professional and pedagogical skills of future teachers.
Tasks of the course: to create learning environment for preparing professionally mature and competent teacher that will use the innovative technologies in teaching chemistry.
Contents of the course:

1. Development of chemistry lessons using «Power Point».
2. Development of didactical and methodological materials for teachers, using the software package "Microsoft Office" and "Chem Office".
3.

Teaching Staff: Hvozdiyevskyy YE.YE., Assistant at the Department of Chemistry.

Course length: 1,5 ECTS credits, 54 hours total – 13 weeks, 4,2 hours a week.

Assessment: current assessment (2), module control (2), credit test.

Course: CHEMICAL ENERGETICS
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: the formation in-depth system of knowledge in chemical thermodynamics; study of the possibilities of application of methods of chemical thermodynamics in the analysis of thermo chemical processes, processes involving chemical and phase transformations that occur in one-component, multi-component and multiphase systems.
Tasks of the course: basic laws and concepts of chemical thermodynamics; mathematical models of chemical and phase equilibria; basic relations that characterize the chemical and phase equilibria of different environments: perfect, imperfect, gaseous, liquid, solid, single-component, multi-component, etc.
Contents of the course:

1. Chemical thermodynamics. The chemical affinity and reactivity of compounds.
2. Thermodynamics of phase equilibria.

Teaching Staff: Titov Yu.O., Doctor of Chemistry, Associate Professor at the Department of Chemistry.

Course length: 2 ECTS credits, 72 hours total – 18 weeks, 4 hours a week.

Assessment: current assessment (1), module control (1), final exam.

Course: ENVIRONMENTAL CHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: to consolidate, deepen and expand the basic theoretical concepts, practical skills obtained by students in the course of analytical chemistry, to prepare future chemists to analyze not only in the classroom but also in natural conditions.
Tasks of the course: to study chemical composition of environmental objects, methods and the peculiarities of analysis of environmental objects, techniques of analysis of natural objects.

Contents of the course:

1. Environmental pollution and methods of control.
2. Methods for monitoring natural components and anthropogenic pollutants.

Teaching Staff: Yanovych I.V., PhD in Chemistry, Senior Lecturer at the Department of Chemistry, Kychkyruk O.Yu., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 2 ECTS credits, 72 hours total – 10 weeks, 7,2 hours a week.

Assessment: current assessment (2), module control (2), final exam.

Course: ELECTROCHEMISTRY
Status: compulsory course
Year of study, semester: the first year of study, the 2d semester

The aim of the course: to consolidate, deepen and expand the basic theoretical concepts, practical skills obtained by students in the course of analytical chemistry, to prepare future chemists to analyze not only in the classroom but also in natural conditions.

Tasks of the course: use of cryoscopic method in electrochemistry of solutions and melts, the introduction of electrochemical methods of determining thermodynamic properties of solutions of strong electrolytes; familiarization with the methods of computerized calculation of the average activity coefficient of electrolyte by method of measurements of lowering the temperature of crystallization.

Contents of the course:

1. Cryoscopic method in electrochemistry of solutions and melts. Cryoscopic method for determining activity coefficients.
2. Electrochemical methods for determining thermodynamic properties of solutions of strong electrolytes.

Teaching Staff: Tomashyk V.M., Doctor of Chemistry, Associate Professor at the Department of Chemistry.

Course length: 2 ECTS credits, 72 hours total – 10 weeks, 7,2 hours a week.

Assessment: current assessment (2), module control (2), final exam.

Course: MAERIALS SCIENCE
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: to consolidate, deepen and expand the basic theoretical concepts, practical skills of the main problems of materials science, solid-state, semiconductor, nanomaterial; to consider the latest researches on problems of materials science in Ukraine and abroad, too determine areas of development and the fields where materials science research can be used.

Tasks of the course: study data on aggregate states of matter. Physical and chemical parameters of aggregate states. Plasma. Gas state of matter. The liquid state of matter. The solid state of matter. Amorphous and crystalline state of matter. Mastering theoretical foundations of materials science. Features of the crystal structure of natural crystal lattice, defects in the crystal. Determining the impact of defects on the physical and chemical properties of crystals. The dependence of electronic conductivity from the presence of defects in crystals. Optical properties and defects of crystals. Influence of defects on mechanical properties.
To teach students useful skills and abilities to operate computer programs, the mathematical and computer processing of experimental data, the explanation of the obtained results.
Contents of the course:

1. The doctrine of physical states of matter.
2. The theoretical basis of materials science.

Teaching Staff: Tomashyk V.M., Doctor of Chemistry, Associate Professor at the Department of Chemistry, Denysiuk R.O., PhD in Chemistry, Associate Professor at the Department of Chemistry.

Course length: 2,5 ECTS credits, 90 hours total – 18 weeks, 5 hours a week.

Assessment: current assessment (1), module control (1), final exam.

Course: CHEMICAL METHODS OF SYNTHESIS OF INORGANIC SUBSTANCES AND MATERIALS
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: to teach students to plan and carry out the syntheses of inorganic substances by known methods independently and to examine their properties in order to identify the base material.

Tasks of the course: to practice the skills of students' independent work on the technique of chemical experiment (work with standard and special chemical apparatus and appliances), working on specific examples of the simplest operations:
Filtration, crystallization, drying, evaporation etc.
To teach students useful skills and abilities to operate computer programs, the mathematical and computer processing of experimental data, the explanation of the obtained results.

Contents of the course:

1. Basic chemical operations: purification, recrystallization, distillation, etc of inorganic substances.
2. General and special methods of synthesis of specific inorganic substances and study of their structure and properties.

Teaching Staff: Lystvan V. M., PhD in Chemistry, Associate Professor at the Department of Chemistry.
Course length: 2 ECTS credits, 72 hours total – 18 weeks, 4 hours a week.

Assessment: current assessment (1), module control (1), credit test.

Course: METHODS OF TEACHING CHEMISTRY IN HIGHER EDUCATIONAL INSTITUTION
Status: compulsory course
Year of study, semester: the first year of study, the 1st and 2d semesters

The aim of the course: providing the student with knowledge, skills and abilities that will create in the future professional and methodical base of high school teacher, will help future teachers optimally and effectively design classes, to implement in training progressive elements of innovative technologies, to carry out operational and quality control of educational achievements of students in conditions of credit-modular system of training..
Tasks of the course: to prepare students for teaching basic courses of chemistry in higher educational institutions; to develop skills and abilities for selecting and structuring the learning material of the basic chemical disciplines; mastering the specific forms, methods and means of realization of professional activity depending on the characteristics of the discipline; modeling of the main forms of work as close to real conditions as possible; practical use of acquired knowledge, skills and abilities in the practice of teaching in higher education.

Contents of the course:

1. Theoretical foundations of organization of educational process at chemistry in higher educational institutions.
2. Basic forms and methods of teaching students.
3. The methods of studying some courses of chemistry in higher educational institutions.

Teaching Staff: Romanyshyna L.M., Doctor of Pedagogical Sciences, Professor at the Department of Chemistry.

Course length: 3 ECTS credits, 108 hours total – 28 weeks, 4 hours a week.

Assessment: current assessment (1,2), module control (2), credit test, final exam.

Course: THEORETICAL FUNDAMENTALS OF ORGANIC CHEMISTRY AND MODERN RESEARCH METHODS
Status: compulsory course
Year of study, semester: the first year of study, the 1st semester

The aim of the course: in-depth study of the issues of the structure of organic compounds by students, modern methods of establishing the structure, mechanisms of organic reactions.
Tasks of the course: in-depth study of the issues of the structure of organic compounds by students, modern methods of establishing the structure, mechanisms of organic reactions.

Contents of the course:

1. The structure of organic compounds.
2. Reactivity of organic compounds.
3. Mechanisms of organic reactions.

Teaching Staff: Lystvan V. V., PhD in Chemistry, Associate Professor at the Department of Chemistry.
Course length: 3 ECTS credits, 108 hours total – 18 weeks, 6 hours a week.

Assessment: current assessment (1), module control (1), final exam.