Odessa National Medical University
Pharmaceutical faculty
Department of Pharmaceutical Chemistry

Syllabus of the course
General and Inorganic Chemistry

Amount	6 credits 180 hours
Semester, year of study	1,2 semesters 1 year of study
Days, time, place	Days, time and place are determined according to the approved schedule
Teachers	Osiychuk Olga Volodymyrivna, Ph.D., Associate Professor Lytvynchuk Iryna Viktorivna, assistant Golubchik Khrystyna Olegivna, Ph.D., assistant Ulizko Igor Vitaliyovych, assistant
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Workplace	Department of Pharmaceutical Chemistry
Consultations	Consultations take place according to the approved schedule, both offline (face-to-face) and online, using ICT available to students and teachers

COMMUNICATION with students: E-mail, social networks, face-to-face meetings.

COURSE ANNOTATION

The subject of study of the discipline:

- the relationship of chemical processes and the phenomena that accompany them;
- patterns between the chemical composition, structure of substances and their properties;
- establishing the probability of flow and direction of chemical reactions;
- determination of the function of substances in acid-base and redox processes;
- physico-chemical bases of use of inorganic substances in medicine and pharmacy.

Prerequisites: knowledge of *chemistry* (terminology, basic laws and concepts), *physics* (physical terminology, basic physical laws of matter), *biology* (biological role of chemical elements), *mathematics* (knowledge of basic mathematical operations, arithmetic and algebraic calculations in solving chemical problems).

Postrequisites: acquisition of knowledge in inorganic chemistry and their application for further study of the cycle of chemical, biological, medical disciplines, and will be widely used in the practical work of the specialist.
The purpose of the course: formation of the initial level of students' knowledge necessary for further successful study of chemical and special disciplines and professional tasks, instilling in students skills of chemical thinking and generalization of experimental results, ability to analyze the properties of substances and anticipate their interaction, products of chemical transformations and offer storage conditions and possible methods of analysis.
Tasks of discipline: formation of students' basic chemical concepts, awareness of the relationship of composition and structure of substances with their properties, mastering the basic laws of chemical processes, the use of theoretical knowledge in solving practical problems, the development of chemical thinking, the ability to independently acquire scientific knowledge of chemistry.
Expected results:
– know the relationship between chemical processes and the phenomena that accompany them;
– know the patterns between the chemical composition, structure of substances and their properties;
– be able to establish the probability of flow and direction of chemical reactions;
– be able to determine the functions of substances in acid-base and redox processes;
– know the physico-chemical basis of the use of inorganic substances in medicine and pharmacy;

COURSE DESCRIPTION

Forms and methods of teaching

The course will be presented in the form of lectures (30 hours) and practical classes (80 hours), organization of independent work of students (70 hours).
The lectures use a multimedia presentation; in practical classes - teaching materials, situational tasks, individual tasks, laboratory equipment, to test the acquired knowledge and skills - test and calculation tasks, for independent work provided a list of necessary literature sources.
The content of the discipline
Topic 1. Introduction to the study of general and inorganic chemistry. Basic concepts and laws of chemistry.
Topic 2. The structure of the atom and its electronic shells.
Topic 3. Atomic nucleus. Radioactivity. Nuclear reactions.
Topic 4. Periodic law of D.I. Mendeleev and its interpretation based on the electronic structure of atoms.
Topic 5. Chemical bond and structure of molecules.
Topic 6. Classes and nomenclature of inorganic compounds. Oxides, peroxides, peroxides, ozonides and hydroxides.
Topic 7. Energy and direction of chemical processes.
Topic 8. The rate of chemical reactions.
Topic 9. Catalysis.
Topic 10. Methods of expressing the quantitative composition of solutions.

Topic 11. Properties of solutions of electrolytes and non-electrolytes.
Topic 12. General characteristics of hydrolysis of salts.
Topic 13. Redox reactions.
Topic 14. Complex compounds.
Topic 15. Introduction to the chemistry of elements and their compounds. Properties of metals and nonmetals.
Topic 16. General characteristics of s-elements. Physical and chemical properties of simple substances and compounds of elements of IA group. Hydrogen.
Topic 17. Physical and chemical properties of simple substances and compounds of elements of IA group. Subgroup of alkali metals.
Topic 18. Physical and chemical properties of simple substances and compounds of elements of IIA group.
Topic 19. General characteristics of p-elements. Physical and chemical properties of simple substances and compounds of elements of IIIA group.
Topic 20. Physical and chemical properties of simple substances and compounds of elements of IVA group. Properties of carbon, silicon and their compounds.
Topic 21. Physical and chemical properties of simple substances and compounds of elements of IVA group. Elements of the subgroup Germaniy.
Topic 22. Physical and chemical properties of simple substances and compounds of elements of VA group. Nitrogen.
Topic 23. Physical and chemical properties of simple substances and compounds of elements of VA group. Phosphorus.
Topic 24. Physical and chemical properties of simple substances and compounds of elements of VA group. Elements of the Arsenic subgroup.
Topic 25. Physical and chemical properties of simple substances and compounds of elements of VIA group. Oxygen.
Topic 26. Physical and chemical properties of simple substances and compounds of elements of VIA group. Sulfur. Selenium and Tellurium as analogues of Sulfur.
Topic 27. Physical and chemical properties of simple substances and compounds of elements of VIIA group. A subgroup of halogens.
Topic 28. Physical and chemical properties of noble gases.
Topic 29. General characteristics of d-elements. Elements IIIB, IVB, VB groups.
Topic 30. Physical and chemical properties of simple substances and compounds of elements of VIB group.
Topic 31. Physical and chemical properties of simple substances and compounds of elements of VIIB group.
Topic 32. Physical and chemical properties of simple substances and compounds of elements of VIIIB group.
Topic 33. Physical and chemical properties of simple substances and compounds of elements of IB group.
Topic 34. Physical and chemical properties of simple substances and compounds of elements of IIB group.
Topic 35. Physical, chemical and medical-biological properties of simple substances and compounds of d-elements.

List of recommended reading

1. Levitin Ye.Ya. General and inorganic chemistry: Textbook for students of higher schools / Levitin Ye.Ya., I.O.Vedernikova. – Kharkiv: Publishing House NUPH: Golden Pages, 2009. – 360p.
2. Левітін Є. Я., Бризицька А. М., Клюєва Р. Г. Загальна та неорганічна хімія. – Х.: НФаУ; Золоті сторінки, 2017. – 512 с.
3. Неорганічна хімія. Лабораторний практикум / Є.Я. Левітін, О.В. Антоненко, А.М. Бризицька та ін. – Х.: НФаУ: Золоті сторінки, 2012. – 148 с.
4. Загальна хімія / В. В. Григор'єва, В. М. Самійленко, А. М. Сич, О. А. Голуб – К. : Вища шк., 2009. – 471с.
5. Неділько С. А. Загальна й неорганічна хімія: задачі і вправи: Навч. посібник / С. А. Неділько, П. П. Попель. – К. : Либідь, 2001. – 400 с.

EVALUATION

During the study of the discipline various forms of lesson control are used (oral, written, combined, testing, practical skills, etc.). The results of students' academic performance are presented in the form of assessment on the national scale, 200-point and ECTS scale and have standardized generalized criteria for assessing knowledge.

Assessment of knowledge is on a national scale:

- a grade "excellent" is given to a student who systematically worked during the term, showed during the test versatile and deep knowledge of the program material, is able to successfully perform the tasks provided by the program, mastered the content of basic and additional literature, realized the relationship of individual sections of the discipline importance for the future profession, showed creative abilities in understanding and using educational material, showed the ability to independently update and replenish knowledge; level of competence - high (creative);
- a grade "good" is given to a student who has shown full knowledge of the curriculum, successfully completes the tasks provided by the program, mastered the basic literature recommended by the program, showed a sufficient level of knowledge in the discipline and is able to independently update and update during further study and professional activity; level of competence - sufficient (constructive-variable);
- a grade "satisfactory" is given to the student who has shown knowledge of the basic educational program material in the volume necessary for the further training and the subsequent work on a profession, copes with performance of the tasks provided by the program, has made separate mistakes in answers on examination and at performance of examination tasks, but has the necessary knowledge to overcome mistakes under the guidance of a researcher; level of competence - average (reproductive);
- a grade "unsatisfactory" is given to the student who did not show sufficient knowledge of the basic educational and program material, made fundamental mistakes in performance of the tasks provided by the program, cannot use the knowledge at the further training without the help of the lecturer/tutor, failed to

master skills of independent work; the level of competence is low (receptive-productive).

The order of assessment of student's educational activity

*Methods of current control:*current controlcarried out at each practical lesson in accordance with the specific objectives of the topic. All practical classes use objective control over the performance of independent work, theoretical training and acquisition of practical skills. The following means of diagnosing the level of preparation of students are used: oral examination, testing, solving situational problems.

A form of final control knowledge of the discipline is an exam. The grade for the discipline is 50% of the current performance (arithmetic mean of all current student grades) and 50% - the grade on the exam.

To evaluate the discipline on a 4-point traditional (national) scale, the average score for the discipline is first calculated as the arithmetic mean of the two components:

1. the average current score as the arithmetic of all current scores (calculated as a number rounded to 2 (two) decimal places.
2. traditional exam grade.

Tickets for the exam consist of theoretical (2 questions) and practical questions (2 questions) in all sections studied in this discipline. Tasks include all the main sections of the course, designed for written completion within 90 minutes. Designed to test knowledge, skills and abilities in solving specific problems. Examples of examination questions are given in the appendix to the work program

Conversion of a traditional grade from a discipline on a multi-point scale.

The multi-point scale characterizes the actual success of each student in mastering the discipline. Conversion of the traditional grade from the discipline to 200-point is performed by the information and computer center of the university program "Contingent" according to the formula:

Average score of success (current / discipline) x 40

national assessment	marks
«5»	185-200
«4»	151-184
«3»	120-150

The ECTS rating scale evaluates the achievements of students in the discipline who study in one course of one specialty, in accordance with the points obtained by them, by ranking, namely:

Scale ECTS	Statistical index
«A»	The best 10 % of students
«B»	Next 25 % of students
«C»	Next 30 %of students
«D»	Next 25 % of students

«E»	The last 10% of students

The ECTS scale establishes the student's belonging to the group of the best or worst among the reference group of classmates (faculty, specialty), ie his rating. When converting from a multi-point scale, as a rule, the limits of grades "A", "B", "C", "D", "E" do not coincide with the limits of grades "5", "4", "3" on the traditional scale. A grade of "A" on the ECTS scale cannot be equal to a grade of "excellent", and a grade of "B" - a grade of "good" and so on.

Students who have received grades "Fx" and "F" ("2") are not included in the list of ranked students. Such students automatically receive a score of "E" after re-assembly.

The grade "Fx" is given to students who have scored the minimum number of points for the current educational activity, but who do not pass the final control.

Grade "F" is given to students who have attended all classes in the discipline, but did not score an average score (3.00) for current academic activities and are not admitted to the final control.

COURSE POLICY

Deadline and recompilation policy

Students who have completed all types of work provided for in the initial program, completed all training sessions and scored at least the minimum number of points while studying the module are admitted to the final control.

The practice of missed practical classes, regardless of the reason for the absence, and consultations take place in accordance with the departmental schedule of rehearsals and consultations. The practice of missed practical classes is carried out with an entry in the journal of the department's work and a mark on the permit form from the dean's office. Skipping a lecture without a good reason is completed by the student through an interview with the lecturer, or a presentation of the missed topic. Rearrangement of the current and final modules in order to increase the assessment is not allowed, except for situations provided by the "Regulations on the diploma of the state standard with honors"

Policy of Academic Integrity

Adherence to academic integrity by students provides:

- independent performance of educational tasks, tasks of current and final control of learning outcomes (for persons with special educational needs this requirement is applied taking into account their individual needs and opportunities);
- links to sources of information in the case of the use of ideas, developments, statements, information;
- compliance with the law on copyright and related rights;
- providing reliable information about the results of their own (scientific, creative) activities, used research methods and sources of information.

They are unacceptable in educational activities for participants in the educational process:

- the use of family or business ties to obtain a positive or higher assessment in the implementation of any form of control of learning outcomes or advantages in scientific work;

- use of prohibited auxiliary materials or technical means during checks (cheat sheets, abstracts, headphones, telephones, smartphones, tablets, etc.);
- passing the procedures of control of learning outcomes by fictitious persons.

For violation of academic integrity, students may be held liable for such academic liability:

- reduction of results of assessment of control work, examination, credit, etc.;
- re-assessment (test, exam, test, etc.);
- appointment of additional control measures (additional individual tasks, tests, tests, etc.);
- re-passing the relevant educational component of the educational program;
- conducting additional verification of other works by the infringer;
- deprivation of the right to participate in competitions for scholarships, grants, etc.;
- notification of the entity that finances the training (research), the institution that issued the grant for training (research), potential employers, parents of the applicant for higher education about the violation;
- exclusion from the rating of applicants for an academic scholarship or accrual of penalty points in such a rating;
- deprivation of an academic scholarship;
- deprivation of tuition benefits provided by the University;
- expulsions from the University.

Attendance and lateness policy: attendance at all classes: lectures, practical classes, current and final control is mandatory (exception: good reason). Delay of more than 5 minutes without good reason is not allowed. Within two days, in any form convenient for the student, inform the dean's office about the reasons that make it impossible to attend classes and perform other tasks provided by the curriculum.

Mobile devices: it is forbidden to write off during the control of knowledge (including the use of mobile technical means of information transfer).

Behavior in the audience:

- attend lectures, laboratory classes according to the schedule in medical gowns;
- do not be late for class;
- do not talk during classes;
- turn off your mobile phone.