

Odesa National Medical University
Faculty Pharmaceutical, international
Department Clinical Chemistry and Laboratory Diagnostics

Syllabus of the academic discipline

“LABORATORY DIAGNOSTICS”

Scope of the academic discipline	Total number of hours per discipline: 90 hours, 3credits. Semester: VII. 4 year of study
Days, time, place of educational discipline	According to the schedule of classes. Department of clinical chemistry and laboratory diagnostics. Odesa, st. Olhiivska, 4a. Main building of ONMedU, 2nd floor.
Teacher(s)	G.F. Stepanov, candidate of medical sciences, Associate Professor, head of the department. Associate Professors: candidate of biological sciences Storchylo O.V. Senior lecturers: candidate of biological sciences Oliynyk K.V. Assistants: Kostina A.A., Poplavska N.A.
Contact information	Reference by phone: Kostina Alina Anatolyivna, head teacher of the department 712-31-05, responsible for organizational and educational work of the department Buryachkivska Oksana Leonidivna , laboratory technician of the department 728-54-78 E-mail: medchem@ukr.net Face-to-face consultations: from 2:00 p.m. to 5:00 p.m. every Thursday, from 9:00 a.m. to 2:00 p.m. every Saturday Online consultations: from 2:00 p.m. to 5:00 p.m. every Thursday, from 9:00 a.m. to 2:00 p.m. every Saturday. The link to the online consultation is provided to each group during classes separately.

COMMUNICATION

Communication with applicants will be conducted in the classroom (face-to-face). During distance learning, communication is carried out through the Microsoft Teams platform, as well as through e-mail correspondence, Viber messengers (through groups created in Viber for each group, separately through the head of the group).

REQUISITES OF THE EDUCATIONAL DISCIPLINE

The subject of study of the discipline is the chemical composition of living organisms (the human body) and the biochemical transformations to which the molecules that make up them are subject.

Prerequisites and post-requisites of the discipline (place of the discipline in the educational program):

Prerequisites: to study the course, students must have knowledge of biological chemistry, physiology, anatomy, pathological physiology, pharmacology, pharmaceutical chemistry.

Post-requisites: mastering the educational material of the discipline allows you to acquire knowledge and skills in the courses of clinical pharmacy, pharmacotherapy with pharmacokinetics, medicinal toxicology, toxicological and forensic chemistry, which involves the integration of teaching with these disciplines and the formation of skills to apply knowledge of laboratory diagnostics in the process of further education and professional activity. to study the course, students need basic knowledge of medical biology, biophysics, medical chemistry, morphological disciplines, sufficient for perceiving the categorical apparatus of the subject, understanding the chemical nature of the main substances that make up living organisms and the biochemical processes that occur in them.

The purpose of the discipline: to acquaint students of the Faculty of Pharmacy with modern methods of clinical diagnosis of diseases using various objects of research: whole blood, blood serum and plasma, urine and other biological materials, as well as for students to acquire practical skills necessary for independent conduct of individual studies.

The task of the discipline: formation of clear ideas of students about the principles and methods of determining the main clinical indicators, the meaning of indicators in the norm and in pathology, about the influence of drugs on the indicators of clinical and laboratory examination and the use of the acquired knowledge in the process of further education and professional activity.

Expected results:

As a result of studying the academic discipline, the applicant must:

Know:

- the value of clinical laboratory studies;
- the international system of measurement units;
- concepts: screening and constellations of laboratory tests, dispensary examination;
- causes of errors in laboratory diagnostics;
- basics of medical terminology; modern methods of research of blood, serum and blood plasma, urine and other biological fluids;
- normal parameters of laboratory tests and their changes during pathological processes;
- the principles of the sanitary and anti-epidemic regime in the clinical and diagnostic laboratory;
- safety rules during the work in the **KDL**, compliance with the rules of personal hygiene, asepsis and antiseptics requirements;
- principles of manufacturing reagents, washing laboratory dishes, sterilization, disinfection;
- peculiarities of preparing the patient for laboratory research, taking material, delivering it to the laboratory, decontamination of biological material;
- forms and procedure for quality control of laboratory research;
- current orders and instruction letters of the Ministry of Health of Ukraine.

Be able:

- To analyze the correspondence of the structure of bioorganic compounds to the physiological functions they perform in the human body.

- To interpret the peculiarities of the physiological state of the body and the development of pathological processes because of laboratory studies.
- To analyze the reactivity of carbohydrates, lipids, amino acids, which ensures their functional properties and metabolic transformations in the body.
- To interpret the peculiarities of the structure and transformations of bioorganic compounds in the body as the basis of their pharmacological action as medicines.
- To interpret the biochemical mechanisms of the occurrence of pathological processes in the human body and the principles of their correction.
- To explain the basic mechanisms of biochemical action and the principles of targeted use of various classes of pharmacological agents.
- To explain the biochemical and molecular basis of the physiological functions of cells, organs and systems of the human body.
- To classify the results of biochemical studies and changes in biochemical and enzymatic indicators used for the diagnosis of the most common human diseases.

DESCRIPTION OF THE EDUCATIONAL DISCIPLINE

Forms and methods of education

The course will be taught in the form of lectures (30 hours), organization of students' independent work (60 hours).

Teaching methods: lectures, explanations, conversations, multimedia presentations, laboratory work, problem solving, oral survey, testing, etc.

Content of the academic discipline

Fundamentals of biological chemistry.

Content module 1.

Metabolic transformations in the body during pathology

Topic 1. Introduction to laboratory and functional diagnostics.

Topic 2. Fundamentals of medical enzymology.

Topic 3. Pathochemistry and laboratory diagnostics of carbohydrate metabolism.

Topic 4. Violation of the intermediate metabolism of certain classes (representatives) of carbohydrates.

Topic 5. Pathochemistry and laboratory diagnostics of lipid metabolism.

Topic 6. Pathochemistry and laboratory diagnostics of amino acid metabolism.

Content module 2.

Topic 7. Research of the blood system.

Topic 8. Lipoproteins of blood plasma.

Topic 9. Respiratory function of blood.

Topic 10. Hemostasis system and its disorders.

Topic 11. Laboratory investigations in kidney and urinary tract diseases.

Topic 12. Laboratory investigations in diseases of the digestive organs.

Topic 13. Laboratory investigations in respiratory diseases.

Topic 14. Laboratory investigations in diseases of the endocrine system.

Topic 15. Final control of knowledge: assessment.

List of recommended literature:

Main:

1. 1.Zalubovska O.I., Zlenko V.V., Litvinova O.M. Drug influence on laboratory indices: Manual for students of medical and pharmaceutical higher schools and colleges – Kh., NuPh, 2014. – 99 p.
2. Daniels R. Delmar's Guide to Laboratory and Diagnostic Tests. – Cengage Learning; 003 edition (January 8, 2014). –1024 p.
3. 3.Frances T Fischbach. A Manual of Laboratory and Diagnostic Tests, 9th edition. – Lippincott Williams & Wilkins Publishers, 2014. – 1261 p.

Additional literature

1. Lippincott Illustrated Reviews: Biochemistry/Ferrier D. – Philadelphia :Wolters Kluwer, 2017. – 560 p.
2. Harper's Illustrated Biochemistry / V.W. Rodwell, D.A. Bender, K.M. Botham et al. – Mc Graw Hill Education, 2015. – 817 p.
3. Satyanarayana U. Biochemistry. 4th edition. India 2014.
4. Lehninger. Principles of Biochemistry. 7th edition. NY, United States. 2017.
5. Storchylo O. V. Membrane digestion and absorption of some nutrients in vitro and in vivo: Revision and analysis of own Data. *Journal of Gastrointestinal & Digestive System*. 2018. Vol. 8. DOI: 10.4172/2161-069X-C1-064 (12th Global Gastroenterologists Meeting and 3rd International Conference on Metabolic and Bariatric Surgery, Barcelona, Spain, 15-16 March 2018).
6. Storchylo O. V. (2019) Mechanisms of radioprotective and radiocorrective effects of dietary phytoadditive of milk thistle fruits. *Environment&Health*. 2019. №1 (90). P. 33-37. <https://doi.org/10.32402/dovkil2019.01.033>.
7. Storchylo Olha V. (2019) Mechanisms of the implementation of damage to the functions of the small intestine in two generations of posterity of irradiated rats. *Seventh International Conference on Radiation in Various Fields of Research (RAD 2019)*. June 10-14, 2019|Hunguest Sun Resort|Herceg Novy|Montenegro| www.rad-conference.org. P.452. https://www.rad-conference.org/Book_of_Abstracts-RAD_2019.pdf.

EVALUATION

Forms and methods of current control: oral survey, testing, assessment of performance of practical skills, assessment of communication skills during role play, solution of situational clinical tasks, assessment of activity in class.

Current evaluation criteria in practical training

Mark	The structure of evaluation of the current educational activity of one seminar session
Excellent «5»	The student is fluent in the material, takes an active part in discussing and solving the situational problem, knows how to write the main biochemical reactions that occur in the body, determine the main biochemical indicators in biological objects and give them a medical (medico-biological) assessment.
Good «4»	The student has a good command of the material, participates in the discussion and solution of the situational problem, knows how to write the main biochemical reactions, determine the main biochemical indicators in biological objects and give them a medical and biological assessment, but allows some insignificant mistakes (inaccuracies) in answering questions.
Satisfactory	The student does not have sufficient knowledge of the material, is unsure of

«3»	participating in the discussion and solving the situational problem, makes mistakes when writing basic biochemical reactions.
Unsatisfactory «2»	The student does not know the material, does not take part in the discussion and solution of the situational clinical problem, has significant gaps in the knowledge of the program material, makes fundamental mistakes when explaining the laws of human metabolism, does not have the necessary practical skills.

Forms and methods of final control: after completing the study of biological chemistry - assessment, after completing the study of bioorganic chemistry - exam, testing.

Only those students of higher education who have completed all types of work provided for in the curriculum and whose average score for the current educational activity is 3.00 or more are admitted to the final examination.

Assessment of knowledge (distribution of points): Exam results are evaluated on a 4-point national ("excellent", "good", "satisfactory", "unsatisfactory") and 200-point scale, and are entered into the student's examination and credit report and credit book .

The average score for the discipline (traditional grade) is calculated as the arithmetic average of the current performance and the exam grade.

The conversion of a traditional grade from a discipline to a 200-point grade is performed by the information and computing center of the university using the "Contingent" program according to the formula:

the average score of success (current / from the discipline) x 40.

National assessment	Score
«5»	185-200
«4»	151-184
«3»	120-150

According to the ECTS rating scale, the achievements of students in the discipline who are studying in the same course of the same specialty are evaluated, according to the points they received, by ranking, namely:

ECTS assessment	Statistical indicator
«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 possibility and conditions of obtaining additional (bonus) points:

A student can receive additional (bonus) points for completing individual tasks:

- participation and report in the student scientific conference;
- participation in the subject olympiad in biochemistry, a report at the student scientific circle;
- preparation of multimedia slides and design of tests;
- translations of scientific articles from foreign languages; abstract work on a certain topic.

INDEPENDENT WORK OF HIGHER EDUCATION ACQUIRES

Independent work involves preparation for each practical session

EDUCATIONAL DISCIPLINE POLICY

Deadlines and Rescheduling Policy:

- Absences of classes for non-respectable reasons are worked out according to the schedule of the teacher on duty.
- Absences due to valid reasons are processed according to an individual schedule with the permission of the dean's office.

Academic Integrity Policy:

Applicants must observe academic integrity, namely:

- independent performance of all types of work, tasks, forms of control provided for by the work program of this educational discipline;
- references to sources of information in the case of using ideas, developments, statements, information;
- compliance with the legislation on copyright and related rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

Unacceptable in educational activities for participants of the educational process are:

- using family or official ties to obtain a positive or higher grade during any form of control of learning outcomes or academic performance;
- use of prohibited auxiliary materials or technical means (cheat sheets, notes, micro-earphones, telephones, smartphones, tablets, etc.) during control measures;
- passing procedures for control of training results by fake persons.

For violation of academic integrity, students may be held to the following academic responsibility:

- a decrease in the results of assessment of control work, assessment in class, credit, etc.;
- retaking the assessment (control work, credit, etc.);
- appointment of additional control measures (additional individual tasks, control works, tests, etc.);
- conducting an additional inspection of other works authored by the violator.

Attendance and Tardiness Policy:

Uniform: medical gown that completely covers outer clothing, cap, mask.

Equipment: notebook, pen.

State of health: applicants suffering from acute infectious diseases, including respiratory diseases, are not allowed to attend classes.

A student who is late for class can attend it, but if the teacher has put "nb" in the journal, he must work out it in the general order.

Use of mobile devices:

Mobile devices may be used by students with the permission of the instructor if they are needed for the assignment.

Behavior in the audience:

The behavior of applicants and teachers in the classrooms must be working and calm, strictly comply with the rules established by the Regulations on academic integrity and ethics of academic relations at Odessa National Medical University, in accordance with the Code of Academic Ethics and University Community Relations of Odessa National Medical University, Regulations on Prevention and detection of academic plagiarism in the research and educational work of students of higher education, scientists and teachers of Odessa National Medical University.