Odessa National Medical University
Faculty Postgraduate Education
Department Clinical Chemistry and Laboratory Diagnostics

Syllabus course

" LABORATORY AND FUNCTIONAL DIAGNOSTICS"

Amount	120 hours / 4.0 ECTS
Year of study	2
Days, time, place	Venue: Odessa, st. Olgiivska, 4a (Main building of ONMedU), Department of Clinical Chemistry and Laboratory Diagnostics. Days and times of classes: According to the schedule of the educational department
Teacher(s)	1. Docent Stepanov Gennadii Fedorovych 2. Docent Storchylo Olha Vyacheslavivna
Contact phone number	(048) 717-35-10; (048) 712-31-05; (048) 728-54-78
E-mail	medchem@ukr.net
Workplace	Odessa, street Olgiivska, 4a (Main building of ONMedU), Department of Clinical Chemistry and Laboratory Diagnostics.
Consultations	According to the schedule posted on the information stand of the department

COMMUNICATION

Communication with graduate students will take place in the classroom.

During distance learning, communication is carried out through the Microsoft Teams platform, as well as through e-mail, Viber, Telegram, and WhatsApp messengers.

COURSE ABSTRACT

The subject of the discipline -biochemical mechanisms of the functioning of individual organs and tissues, integrative interactions and relationships between them, which are the basis of the functioning of the body as a single integrated system and modern methods of clinical diagnosis of diseases when using various biological materials as research objects (whole blood, serum and blood plasma, urine, etc.).

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

Post-requisites of the course: mastering the educational material of the discipline allows you to acquire knowledge and skills when studying related disciplines during the following years of study and apply them in further scientific and professional activities.

The purpose of the course: to acquaint graduate students 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 the acquisition by graduate students of practical skills necessary for independent conduct of individual studies.

Tasks of the discipline:

- to form clear ideas about the principles and methods of determining the main clinical indicators;
- teach to analyze the value of laboratory parameters in normal and pathological conditions;
- to form an idea 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, a graduate student should know:

- the importance of clinical laboratory studies;
- the international system of units of measurement;
- concepts: screening and constellations of laboratory studies, 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 in pathological processes;
- the principles of the sanitary and anti-epidemic regime in the clinical and diagnostic laboratory;
- safety rules while working in the KDL, compliance with the rules of personal hygiene, asepsis and antisepsis requirements;
- features of workplace equipment during various studies;
- principles of manufacturing reagents, washing laboratory dishes, sterilization, disinfection;
- peculiarities of preparing the patient for laboratory research, taking the material, delivering it to the laboratory, decontamination of the biological material;
- forms and procedure for quality control of laboratory research;
- peculiarities of the mechanisms of biochemical transformations of proteins, carbohydrates, lipids, as well as regulatory and integration processes of their

metabolism in the cells of the liver, kidneys, and pancreas, which ensure maintenance of homeostasis in the body;
- biochemical bases of the functioning of blood as a liquid, unifying tissue of the internal environment;
- peculiarities of metabolic transformations in organs and tissues under physiological and pathological conditions; integrative relationships between metabolic processes of various tissues and organs based on the screening of key biochemical processes in them;
- current orders and instruction letters of the Ministry of Health of Ukraine.

Postgraduate students should be able to:
- work independently with educational and reference literature;
- to equip the workplace;
- carry out separate types of blood plasma (serum) and urine tests and evaluate the results of the test according to the "norm/pathology" criterion;
- work with modern laboratory equipment when performing clinical research: photoelectrocolorimeter, spectrophotometer, pH meter, centrifuge, etc.;
- observe the safety rules while working in the clinical diagnostic laboratory (CDL);
- maintain approved documentation and reporting;
- to determine the amount of proteins in blood serum and preparations of protein origin;
- conduct research on physical and chemical indicators (glucose, ketone bodies, bilirubin, urobilin bodies, hemoglobin) of urine, sediment research;
- conduct research on the acidity of gastric juice, enzymatic activity of gastric contents;
- make calculations of the obtained indicators; to make data enumeration in the International System of Units;
- make generalizations and conclusions from the analysis data;
- evaluate the effectiveness of pharmaceutical treatment using the results of changes in blood, urine, sputum, etc.

COURSE DESCRIPTION

Forms and methods of education

The course is taught in the form of seminar classes (60 hours), as well as through the organization of independent work of graduate students (60 hours); total - 120 hours (4 ECTS).

The main forms of teaching the discipline are: seminar classes, independent work of graduate students. During the teaching of the discipline, the following teaching methods are used: explanations, conversations, multimedia presentations, laboratory work, problem solving, oral survey, testing, etc.

Independent work of graduate students consists in preparation for the implementation and defense of seminar works, preparation for current and final control, execution of training tests, search for information from literary sources and the Internet,

and conducting elements of scientific work.

The scientific work of graduate students is carried out in the work of groups, preparation and presentations at scientific conferences, writing articles.

Content of the academic discipline

Topic 1. Organization of work of the Clinical Diagnostic Laboratory.
Topic 2. The pathochemistry of carbohydrate metabolism.
Topic 3. The pathochemistry of lipid metabolism.
Topic 4. Pathochemistry of amino acid metabolism.
Topic 5. Composition and functions of blood.
Topic 6. Respiratory function of blood.
Topic 7. Hemostasis system and its disorders.
Topic 8. Laboratory studies in kidney and urinary tract diseases.
Topic 9. Laboratory studies in diseases of the digestive organs.
Topic 10. Laboratory studies in diseases of the endocrine system.
Topic 11. Concept of functional state; concept of physiological and morphological norms.
Topic 12. Functional tests of the cardiovascular system.
Topic 13. Functional methods of research of the respiratory system.
Topic 14. Functional research methods for liver diseases.
Topic 15. Functional research methods for kidney diseases.
Topic 16. Final control of knowledge: assessment

List of recommended literature

Main literature

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.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.

EVALUATION

Current control

Current control is carried out at each seminar session by means of an oral survey or written control. Evaluation of the success of the study of subjects of the discipline is carried out according to the traditional 4-point scale. At the end of the study of the discipline, the current success rate is calculated as the average current score, i.e. the arithmetic average of all the grades received by the graduate student according to the traditional scale.

Evaluation criteria for current knowledge control:

"excellent" is awarded to a graduate student who is fluent in the program material, knows how to write the main reactions, determine the main indicators in biological objects and give them a medical and biological assessment, knows how to use the acquired knowledge and skills to solve problems, is able to produce innovative solutions problems, convincingly argues the answers.

"good" is awarded to a graduate student who is fluent in the program material, knows how to write the main reactions, determine the main indicators in biological objects and give them a medico-biological assessment, but allows some insignificant mistakes (inaccuracies) in answering questions.

"satisfactory" is received by a graduate student who navigates all the questions of the program and has necessarily mastered the questions of the minimum qualification, who knows how to determine the main indicators in biological objects and give them a medico-biological assessment, but mistakes are made, among which there are a significant number of significant ones.

"unsatisfactory" is received by a graduate student who has significant gaps in knowledge of the program material, makes fundamental mistakes when explaining the laws of human metabolism, does not have the necessary practical skills.

Final control

The form of final control is the offset.

A graduate student is admitted to credit provided that he attends all classes, has no academic debt and has an average score for current academic activities of at least 3.00.

Final control in the form of credit is evaluated on a two-point scale:

– the grade "passed" is given to a graduate student who has completed the curriculum of the discipline, has no academic debt and has an average score for the current educational activity of at least 3.00; the level of competence is high (creative);

– grade "failed" is issued to a graduate student who has not completed the curriculum of the discipline, has academic debt (average grade below 3.0 and/or missed classes); the level of competence is low (receptive-productive).

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	points
"5"	185-200
"4"	151-184
"3"	120-150

Individual independent work of graduate students.

Tasks for independent work are mandatory tasks that a graduate student must prepare for each lesson; taking notes, filling out a workbook, studying vocabulary, studying subtopics that do not require explanation.

The independent work of graduate students, which is provided by the topic of the lesson along with the classroom work, is evaluated during the current control of the topic in the corresponding lesson. Mastery of topics that are presented only for independent work is checked during assessment.

COURSE POLICY

Deadlines and Rescheduling Policy

Postgraduate students are expected to attend all seminar classes. If the student of higher education was absent from classes for any reason, then the practice is carried out within the deadlines set by the teacher in accordance with the "Regulations on the organization of the educational process at ONMedU" (link to the regulations on the university's website https://onmedu.edu.ua/wp-content/uploads/2020/01/osvitnijproces.pdf). Reassembly is carried out in accordance with the approved schedule.

Academic Integrity Policy

The policy of the educational component is based on the principles of academic integrity (link to the regulations on the university's websitehttps://onmedu.edu.ua/wp-content/uploads/2020/07/polozhennja-prodobrochesnist.pdf) and is determined by the system of requirements that the teacher presents to the student when studying the educational component:

- independent performance of educational tasks, tasks of current and final control (current controls and credit in the discipline) of learning results (for persons with special educational needs, this requirement is applied taking into account their individual needs and capabilities);
- references to sources of information in case of use of ideas, developments, statements, information;
- provision of reliable information about the results of one's own (scientific, creative) activity, used research methods and sources of information.

It is unacceptable in educational activities for the participants of the educational process

use of prohibited auxiliary materials or technical means (cheat sheets, notes, micro-earphones, telephones, smartphones, tablets, etc.) during control measures.

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

- decrease in the evaluation results of the control work, exam, credit, etc.;
- retaking the assessment (test, exam, credit, etc.);
- appointment of additional control measures (additional individual tasks, control papers, tests, etc.)

Attendance and lateness Policy

Attending seminar classes is mandatory. If you are late for more than 15 minutes, the lesson is considered missed and you need to make up for it.

Mobile devices

During seminar classes, the use of a smartphone, tablet or other device for storing and processing information is allowed only with the teacher's permission.

During any form of control, the use of mobile devices and their accessories is strictly prohibited.

Behavior in the audience

During classes, it is allowed to: leave the audience for a short time if necessary and with the teacher's permission; take photos of presentation slides; take an active part in the lesson.

During classes, it is forbidden to: eat (with the exception of persons whose special medical condition requires otherwise - in this case, medical confirmation is required); smoke, use alcoholic and low-alcohol drinks or narcotic drugs; speak obscenely or use words that insult the honor and dignity of colleagues and teaching staff; to cause damage to the material and technical base of the university.