

MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

Faculty of medicine

Department of occupational pathology, clinical laboratory and functional
diagnostics

Syllabus of elective educational discipline

Basics of clinical and laboratory diagnostics

Volume	Total hours/credits ECTS 90/3.0 (practical classes 30 hours, IWS 60 hours)
Semester, year of study	IX-X semester V course
Days, time, place	According to the approved schedule of classes. Forms of education: full-time.
Teacher(s)	Ph.D, Associate Professor Oparina T.P., Ph.D., Associate Professor Zahorodnya L.I., Ph.D., Associate Professor, Ph.D. Yamilova T.M., PhD in biology, assistant Dobrovolskaya O.O.
Contact phone number	(048)704 78 79
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Workplace	Department of occupational pathology, clinical laboratory and functional diagnostics; educational and production laboratory of molecular pathology of ONMedU
Consultations	Help by phone: Oparina Tamara Pavlivna, head teacher of the department 0674849012 Tatyana Mykolaivna Yamilova 0505222048 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 4:00 p.m. to 6:00 p.m. every Thursday, from 9:00 a.m. to 2:00 p.m. every Saturday.

COMMUNICATION

Communication will be carried out through face-to-face meetings, with distance learning using the Internet, Telegram, WhatsApp, and the Microsoft Teams platform.

Language of study: English.

COURSE ABSTRACT

The subject of study of the elective academic discipline is theoretical knowledge and practical skills and abilities in matters of organization of laboratory research in the field of health care; diagnosis and control of the treatment of the most typical diseases.

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

Prerequisites: Ukrainian language (for professional fields), foreign language (for professional fields), medical chemistry, biological and bioorganic chemistry, medical and biological physics, pathophysiology, pathomorphology, organization and economics of health care, internal medicine, phthisiology, dermatology, psychiatry, narcology, otorhinolaryngology, neurology, traumatology and orthopedics.

Postrequisites: internal medicine, infectious diseases, otorhinolaryngology, epidemiology, neurology, dermatology, occupational diseases, oncology, health care organization, traumatology and orthopedics, allergology.

The purpose of studying a elective discipline is the formation, assimilation and systematization of knowledge and skills from the analytical and clinical foundations of laboratory diagnostics, which will allow planning, organizing, independently conducting and interpreting laboratory studies of biological material; to rationally use laboratory algorithms for various forms of pathology.

Tasks of the discipline:

- 1) providing the applicant of higher education with knowledge regarding the appointment of a laboratory examination of a patient, the use of laboratory research data in preclinical diagnostics, differential diagnosis, control of treatment and prognosis of the development of the most common diseases;
- 2) provision of knowledge regarding diagnostic procedures that are most often used in the practice of clinical laboratories;
- 3) provision of knowledge regarding the principles of constructing diagnostic search algorithms for the most frequent pathological conditions and clinical syndromes, as well as requirements for conducting research within evidence-based medicine.

Expected learning outcomes: As a result of studying the academic discipline, the applicant *should know*:

- Classification and systematic approaches to modern laboratory methods of research and the possibility of their use in the practical activity of a doctor;

- Principles of interpretation of the results of the clinical and laboratory examination of the patient;

- Patterns of changes in clinical and laboratory indicators under the influence of various drugs to control the effect of drugs;

be able: - conducting the most common clinical and laboratory analyzes of patients; - build diagnostic search algorithms depending on the purpose of the study, the patient's condition and the capabilities of the laboratory;

- to provide an assessment of the received research results;

- identify signs of errors in laboratory diagnostics.

DESCRIPTION OF THE EDUCATIONAL DISCIPLINE

The course will be taught in the form of practical classes (30 hours) and organization of independent work (60 hours).

Teaching methods: verbal, explanatory and demonstrative, visual, working with a book, video method, working in groups, discussions, solving situational tasks, etc.

Practical classes are conducted on the basis of the department and the educational and production laboratory of molecular pathology of the Odesa National Medical University. The method of organizing classes on laboratory diagnostics requires the following:

- master knowledge of laboratory examination; skills of cooperation with structural divisions of laboratory diagnostics, communication with employees of clinical laboratories;

- to form an understanding of responsibility for the level of training in laboratory diagnostics and the need to improve knowledge and skills during training and professional activity.

For the implementation of the corresponding module specified in the first lesson, a work plan and provision of conditions for its implementation are provided. It includes: studies that need to be mastered; algorithms (protocols) of examinations, establishing a diagnosis, assessing the quality of treatment in accordance with the standards of evidence-based medicine;

Classes are held with the inclusion of:

- 1) control of the initial level of knowledge using test questions and checking workbooks;

- 2) examination of patients with diseases and conditions corresponding to the topic of the lesson, followed by a discussion of the correctness of the examination plan

for establishing a diagnosis, differential diagnosis and treatment measures using the principles of evidence-based medicine and in accordance with National and European guidelines and protocols;

3) consideration of the need for additional laboratory methods of research, which are used in diagnosis and differential diagnosis, the consideration of which is provided by the topic of the seminar.

Independent work involves preparation for practical classes.

CONTENTS OF THE EDUCATIONAL DISCIPLINE

Topic 1. Introduction to laboratory diagnostics.

Topic 2. General clinical research of blood

Topic 3. General clinical research of urine

Topic 4. Biochemical research.

Topic 5. Study of enzymes and hormones in the norm. Clinical significance of hormone and enzyme levels.

Topic 6. Meaning and research of enzymes, hormones and vitamins in diseases of internal organs.

Topic 7. Examination algorithm for endocrine diseases. Sugar profile.

Topic 8. Main syndromes – anemia, inflammation, leukemia and others.

Topic 9. Algorithms of laboratory research of individual organs and systems.

List of recommended literature

Main (basic):

1. Robinson A.T. Pathology — The Beginnings of Laboratory Medicine: First in a Series, Laboratory Medicine. 2021. Vol. 52. No 4. P. e66–e82.

2. West J., Atherton J., Costelloe S.J., Pourmahram G., Stretton A., Cornes M. Preanalytical errors in medical laboratories: a review of the available methodologies of data collection and analysis. Ann Clin Biochem. 2017. Vol.54, No 1. P. 14-19.

3. Yu H.E., Lanzoni H., Steffen T., Derr W., Cannon K., Contreras J., Olson J.E. Improving Laboratory Processes with Total Laboratory Automation. Laboratory Medicine. 2019. Vol.50, No1. P. 96–102.

4. McKenzie S.B., Bergeron J.D., Landis-Piwowar K., Williams L. Clinical Laboratory Hematology, 4-th edition, 2019. 350 p.

5. Cascio M.J., DeLoughery T.G. Anemia: Evaluation and Diagnostic Tests. Med Clin North Am. 2017. Vol.101, No 2. P. 263-284.
6. Pfeiffer C.M., Looker A.C. Laboratory methodologies for indicators of iron status: strengths, limitations, and analytical challenges. Am J Clin Nutr. 2017. Vol. 106, Suppl 6. P.1606S-1614S.
7. Brunzel N.A. Fundamentals of Urine & Body Fluid Analysis, 5th Edition, 2021. 448 p.
8. de Haas V., Ismaila N., Zhang L. Initial Diagnostic Workup of Acute Leukemia: ASCO Clinical Practice Guideline Endorsement Summary of the CAP and ASH Guideline. J Oncol Pract. 2019. Vol. 15, No 2. P. 101-105.
9. Jakšić B., Pejša V., Ostojić-Kolonić S., et al. Guidelines for Diagnosis and Treatment of Chronic Lymphocytic Leukemia. Krohem B-Cll 2017. Acta Clin Croat. 2018. Vol. 57, No 1. P.190-215.
10. Gulati G. Blood cell Morphology: Grading Guide, 2nd Edition. 2017. 98 p.
11. Celkan T.T. What does a hemogram say to us? Turk Pediatri Ars. 2020. Vol. 55, No 2. P.103-116.

EVALUATION

Forms and methods of current control: oral control, survey, practical, test, self-control, etc.

Current assessment criteria at the practical lesson

Grade	Evaluation criteria
«5»	The applicant has a fluent command of the material, takes an active part in discussing and solving a situational clinical problem, confidently demonstrates knowledge during the interpretation of laboratory research data, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
«4»	The applicant has a good command of the material, participates in the discussion and solution of a situational clinical problem, makes some mistakes during the interpretation of laboratory research data, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
«3»	The applicant does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of the situational clinical problem, makes significant mistakes during the interpretation of laboratory research data.

«2»	The applicant does not have a good command of the material, does not participate in the discussion and solution of the situational clinical problem, in the interpretation of laboratory research data.
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Forms and methods of final control: credit test, issued to the applicant who has completed all sections of the educational program of the selected discipline, actively participated in practical classes, has an average current grade of at least 3.0 and has no academic debt.

Conditions for obtaining additional (bonus) points. Possibility and conditions of obtaining additional (bonus) points: not provided.

Independent work. The evaluation of the independent work of the applicants of higher education, which is provided for in the topic along with the classroom work, is carried out during the current control of the topic in the corresponding classroom session, as well as at the final control.

EDUCATIONAL DISCIPLINE POLICY

Deadlines and Rescheduling Policy:

- absences from classes due to non-respectable reasons are made up according to the schedule of the teacher on duty.
- absences due to valid reasons are worked out 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, applicants of higher education may be held to the following academic responsibility:

Attendance and Tardiness Policy Uniform: medical gown, cap, protective mask, change of footwear.

Equipment: notebook, pen.

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

The applicant who is late for class can attend it, but if the teacher has put "nb" in the journal, he must complete it in the general order. Online classes at the department are conducted using the Ms Teams distance learning system. Each applicant must connect to the webinar room in a timely manner. Online classes include on-screen and oral demonstrations of learning materials, dialogue between the teacher and applicants.

Use of mobile devices. Copying, use of various software tools, hints, use of a mobile phone, tablet or other electronic gadgets during class are not allowed. Mobile devices may be used by applicants with the permission of the teacher 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 applicants of higher education, scientists and teachers of Odessa National Medical University.