



**MINISTRY OF HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY
Department Clinical Express Diagnostics In
Healthcare**

EXPRESS DIAGNOSTICS IN HEALTHCARE

**WORK PROGRAM
of educational component**

training for _____ Master _____

field of knowledge _____ 22 Healthcare _____

in specialty _____ 226 Pharmacy, industrial pharmacy _____

of educational program _____ Pharmacy _____

specialization _____ Pharmacy _____

Kharkiv-2022

The work program of the educational component **Express Diagnostics In Healthcare** in specialty **226 Pharmacy, industrial pharmacy** of educational program **Pharmacy** in specialization(s) **Pharmacy** for applicants for higher education **3** year of study.

EDUCATIONAL COURSE TEAM:

Matviichuk O.P. - assistant of IHE of the Department of Clinical Express Diagnostics In Healthcare, PhD, Candidate of Biological Sciences
Dolzhykova O.V. – associate of professor of IHE of Department Clinical Express Diagnostics In Healthcare, D. of Pharm. S., PhD, associate of professor

Work program has been considered and approved at the Department meeting of the Department Clinical Express Diagnostics In Healthcare

Record from «07» September 2022 No. 1

Head of the Department _____



Prof. Rymma YEROMENKO

Work program has been approved at the meeting of the Methodical Commission of Biomedical Sciences

Record from «12» September 2022 No. 1

Head of Specialized Committee _____



Prof. Nadiia KONONENKO

1. 1. Description of the educational component

Language of study: English

Status of the educational component: selective

Prerequisites for studying the educational component: medical biology, pharmacology, medical and biological physics, medical chemistry, biological and bioorganic chemistry, morphological disciplines, human anatomy and physiology, microbiology, therapy and integrates with these disciplines.

The subject of educational component study «**Express Diagnostics In Healthcare**» is studying of the modern express research methods and influencing of drugs on laboratory indicators.

Information content of the educational component. 3 ECTS credit 90 hours are assigned to the study of the educational component.

2. Objectives and tasks of the educational component

The purpose of teaching the educational component «Express Diagnostics In Healthcare» is introduce in to the knowledge about systemic normal laboratory parameters and their changes due to pathology; learn the basic principles of technology information search about laboratory medicine in professional journals and to use it in practice, provide a knowledge about the occurrence and development of typical pathological processes; give systematic knowledge about the influence of drugs on laboratory parameters; create a base that defines professional competence and general erudition of pharmacist.

The main tasks of the educational component «**Express Diagnostics In Healthcare**» is:

- to be able to determine the functional states of the human body and studies of various pathological conditions using the most modern express methods of diagnosis, to learn to master the techniques of doing the research
- to monitor with the help of express survey methods the dynamics of the impact of rehabilitation measures and their effectiveness, to correctly determine the adequacy of the scope and content of methods for diagnosing the effectiveness of restorative therapy, to generalize and apply all the clinical experience of previous training courses in the specialty for the adequacy of assessment of the conditions of the human body.

3. Competence and planned educational outcomes

Educational component «**Express Diagnostics In Healthcare**» ensures the acquisition of applicants for higher education the following **competences**:

CG 11. Ability to evaluate and ensure the quality of performed works.

CG 12. Ability to conduct research at the appropriate level.

PC 5. The ability to monitor the effectiveness and safety of the use of medicinal products by the population according to the data on their clinical and pharmaceutical characteristics, as well as taking into account subjective signs and objective clinical, laboratory and instrumental criteria for the examination of the patient.

Integrative final program learning outcomes (PLO), the formation of which is facilitated by the educational component:

PLO 4. Demonstrate the ability to independently search, analyze and synthesize information from various sources and use these results to solve typical and complex specialized tasks of professional activity.

PLO 17. To use the data of clinical, laboratory and instrumental studies to monitor the effectiveness and safety of the use of medicinal products.

As a result of studying the educational component, the applicant for higher education will be *know*:

- the composition and function of blood, urine, feces, sputum, gastrointestinal contents;
- principles of exploitation and rules of the main types of instrumentation, analyzers, and other equipment, which are used in clinical laboratories for laboratory research;
- the terminology of laboratory diagnostics.

be able to:

- assess the information content of biological material for research in laboratories;
- interpret the results of laboratory tests of blood, urine, feces, sputum, gastrointestinal contents;
- interpret erythrocytic parameters of clinical blood to detect anemic syndrome;
- interpret laboratory parameters of clinical blood to detect the inflammation;
- to characterize the factors that may influence the biomaterial;
- distinguish the typical changes in the results of clinical and laboratory studies of blood, urine, feces, sputum, gastrointestinal contents under the influence of various drugs.

possess:

- basic modern clinical and laboratory methods of research of biological fluids (blood, urine, sputum);
- principles of operation and rules of operation of the main types of measuring devices, analyzers and other equipment used in clinical laboratory research to do laboratory research;
- the principles of analysis of typical changes in the results of clinical laboratory tests of blood, urine, feces, sputum, gastrointestinal contents under the influence of various drugs to control the effect of drugs in order to increase the effectiveness and safety of drug therapy.

4. The educational component structure

Names of content modules and topics	The amount of hours					
	full time study					
	the whole amount	including				self-study
lect.		sem.	pract.	lab.		
Content module 1. Introduction into Express Diagnostics. General principles of laboratory diagnostics. Application of express tests at all stages of the medical and diagnostic process						
Topic 1. General principles of laboratory diagnostics. Laboratory methods of research of biological material. Norms of indicators.	8	1	-	2	-	5
Topic 2. Cardiological tests in laboratory diagnostics. Analysis of the studied indicators and interpretation of the results.	8	1	-	2	-	5
Topic 3. Express tests in the diagnosis of infectious diseases. Analysis of the studied indicators and interpretation of the results.	8	1	-	2	-	5

Topic 4. Express tests in endocrinological practice. Analysis of the studied indicators and interpretation of the results.	8	1	-	2	-	5
<i>Thematic Module Control.</i>	9	-	-	4	-	5
The whole amount of hours for the content module 1	41	4	-	12	-	25
Content module 2. Express methods of detecting oncological, genetic diseases and the content of narcotic substances. The effect of drugs on laboratory indicators.						
Topic 5. Express tests in the diagnosis of oncological diseases.	8	1	-	2	-	5
Topic 6. Express tests for the detection of narcotic substances in the human body. Analysis of the studied indicators and interpretation of the results.	8	1	-	2	-	5
Topic 7. Express diagnosis of genetic diseases. Analysis of the studied indicators and interpretation of the results.	8	1	-	2	-	5
Topic 8. The effect of drugs on laboratory indicators.	9	1	-	2	-	5
<i>Thematic Module Control</i>	7	-	-	2		10
The whole amount of hours for the content module 2	44	4	-	10	-	30
Semester credit from module 1	5	-	-	2	-	3
<i>The whole amount of hours for the course</i>	90	8	-	24	-	58

5. Contents of the educational component

Content module 1. Introduction into Express Diagnostics. General principles of laboratory diagnostics. Application of express tests at all stages of the medical and diagnostic process

Topic 1. General principles of laboratory diagnostics. Laboratory methods of research of biological material. Norms of indicators. The subject and tasks of laboratory diagnostics. General blood test. The main clinical indicators of the blood system. Rules for taking blood for general clinical analysis. Composition and functions of blood. Age-related changes in blood composition. General principles of laboratory diagnostics. Laboratory methods of research of biological material. Norms of indicators. Application of rapid tests at all stages of the medical and diagnostic process. Terms of effective use. Advantages and features.

Topic 2. Cardiological tests in laboratory diagnostics. Analysis of the studied indicators and interpretation of the results. Basic mechanisms of drug-induced anemia. Medicines used to stimulate erythropoiesis. Appointment of iron preparations. Means recommended for stimulation of leukopoiesis. Means that most often suppress the functions of platelets. Anticoagulants, antiaggregants, fibrinolytics. Hemostatic drugs.

Topic 3. Express tests in the diagnosis of infectious diseases. Analysis of the studied indicators and interpretation of the results. Research of physical and chemical properties of blood and urine in infectious diseases. Microscopic examination of urine sediment. Quantity, color, transparency, smell, reactions of relative density. Physical properties of urine in normal conditions and their changes in pathology.

Topic 4. Express tests in endocrinological practice. Analysis of the studied indicators and interpretation of the results. Detection of glucose, hormones and enzymes in blood and urine

Content module 2. Express methods of detecting oncological, genetic diseases and the content of narcotic substances. The effect of drugs on laboratory indicators.

Topic 5. Express tests in the diagnosis of oncological diseases. Analysis of the studied indicators and interpretation of the results

Theme 6. Express tests for the detection of narcotic substances in the human body. Analysis of the studied indicators and interpretation of the results.

Theme 7. Express diagnosis of genetic diseases. Analysis of the studied indicators and interpretation of the results.

Topic 8. The effect of drugs on laboratory indicators.

Semester module supervision 1.

6. Lecture Topics

No.	Name of topic	The amount of hours
		full time study
1	General principles of laboratory diagnostics. Laboratory methods of research of biological material. Norms of indicators.	1
2	Cardiological tests in laboratory diagnostics. Analysis of the studied indicators and interpretation of the results.	1
3	Express tests in the diagnosis of infectious diseases. Analysis of the studied indicators and interpretation of the results.	1
4	Express tests in endocrinological practice. Analysis of the studied indicators and interpretation of the results.	1
5	Express tests in the diagnosis of oncological diseases.	1
6	Express tests for the detection of narcotic substances in the human body. Analysis of the studied indicators and interpretation of the results.	1
7	Express diagnosis of genetic diseases. Analysis of the studied indicators and interpretation of the results.	1
8	The effect of drugs on laboratory indicators	1
The whole amount of hours		8

7. Topics of seminars

Topics are not provided for in the working curriculum

8. Topics of practical lessons

No.	Name of topic	The amount of hours
		full time study
1	General principles of laboratory diagnostics. Laboratory methods of research of biological material. Norms of indicators.	2
2	Cardiological tests in laboratory diagnostics. Analysis of the studied indicators and interpretation of the results.	2
3	Express tests in the diagnosis of infectious diseases. Analysis of the studied indicators and interpretation of the results.	2
4	Express tests in endocrinological practice. Analysis of the studied indicators and interpretation of the results.	6
5	Express tests in the diagnosis of oncological diseases.	2
6	Express tests for the detection of narcotic substances in the human body. Analysis of the studied indicators and interpretation of the results.	2
7	Express diagnosis of genetic diseases. Analysis of the studied indicators and interpretation of the results.	2

8	The effect of drugs on laboratory indicators	4
9	<i>Semester credit of the module 1: "Express Diagnostics In Healthcare and influence of drugs on laboratory parameters"</i>	2
The whole amount of hours		24

9. Topics of laboratorial lessons

Topics are not provided in the Plan of the education

10. Self-study work

No.	Name of topic	The amount of hours
		full time study
1	General principles of laboratory diagnostics. Laboratory methods of research of biological material. Norms of indicators.	5
2	Cardiological tests in laboratory diagnostics. Analysis of the studied indicators and interpretation of the results.	5
3	Express tests in the diagnosis of infectious diseases. Analysis of the studied indicators and interpretation of the results.	5
4	Express tests in endocrinological practice. Analysis of the studied indicators and interpretation of the results.	5
5	Express tests in the diagnosis of oncological diseases.	5
6	Express tests for the detection of narcotic substances in the human body. Analysis of the studied indicators and interpretation of the results.	5
7	Express diagnosis of genetic diseases. Analysis of the studied indicators and interpretation of the results.	5
8	The effect of drugs on laboratory indicators	5
	Preparation for thematic and final module control	23
The whole amount of hours		58

Tasks for Self-study work

1. Consolidation of theoretical course knowledge. In-depth study of the material: preparation for control, practical work, performance of typical tasks; other types of occupations.
2. Development of skills in developing algorithms for laboratory examination of patients.
3. Formation of the student's professional outlook in the field of laboratory diagnostics.
4. Preparation of essays, messages, reports on the most important sections of the discipline.
5. Performance of educational test tasks.
6. Study and solution of situational tasks.

11. Criteria and evaluation order of educational outcomes

During the study course "Express Diagnostics In Healthcare" all student activities are subject to control as the current (in each session) and final (at the time of control tests).

Modular control is mastering the material diagnostics module. In the module provides for 2 current control learning module.

The theoretical component provides test or survey students on the topic of employment, inspection and evaluation of individual work.

Control of content modules (written control of theoretical knowledge in a colloquium, control of practical skills - determining tissue type and count of blood cells by light microscopy study of some reflexes determine pressure and pulse rights, etc.) Made by the timetable.

Current progress is calculated as the sum of scores of current and content module.

Rating student – a student ordinal position among the students of the course of the basic direction of training, specialty, faculty, which is determined based on its rating points.

Grading Scheme

Routine testing and self-learning work		Sum
Thematic module 1	Thematic module 2	60-100
T №1 – T №4	T №5 – T №8	
30-50	30-50	

Assessment of discipline, culminating exam is defined as the sum of scores for current educational activity (at least 69).

Points are converted regardless of discipline as the ECTS scale and 4-point scale. Score scale ECTS 4-point scale not converted and vice versa.

The number of points in the discipline, which assessed students converted a scale ECTS thus:

Mark ECTS	Statistical index
A	Top 10% of students
B	Next 25% of students
C	The next 30% of students
D	Next 25% of students
E	The last 10% of students

The percentage of students determined to voters for the students of the course within the relevant specialty.

Scores of discipline for students who successfully completed the program converted into traditional 4-point scale by absolute criteria listed in the table below.

Total points for the discipline of all educational activities	ECTS	Mark by national scale	
From 90 to 100 points	A	perfectly	pass
From 82 to 89 points	B	fine	
From 74 to 81 points	C	satisfactorily	
From 64 to 73 points	D		
From 60 to 63 points	E	unsatisfactorily	
From 35 to 59 points	FX		fail
From 1 to 34 points	F		

12. Forms of progress and semester supervision of academic achievements:

Semester credit

13. Methodological Support

- Tables.
- Visual aids, models, specimens.
- Tests to monitor each topic.
- Computer software testing.
- Training videos.
- Lecture notes
- Plans for practical classes
- Tasks for laboratory works,
- Tasks for independent work,
- Questions

14. Reading suggestions

The main reading suggestions

1. Laboratory diagnostics: manual for students of pharmaceutical higher schools and pharmaceutical faculties of medical higher schools of the IV accreditation level / Kryzhna S. I., Lytvynova O. M., Berezhnyakova M. Ye. - Kharkiv: NUPhGolden Pages, 2016. - p.
2. Clinical Research of the Blood System: Методические рекомендации для студентов медицинских и фармацевтических ВУЗов. – X. Изд.во НФаУ, 2012 – 105 с.

Supplementary reading suggestions

1. Eder. Laboratory Atlas of Anatomy and Physiology, Fourth Edition / Eder, Kaminsky, Bertram; The McGraw-Hill Companies, 2003. – 192 p.
2. Widmaier Eric P. Strang. Human Physiology: The Mechanisms of Body Function: 9th Edition / Eric P. Widmaier, Hershel Raff, Kevin T.; The McGraw-Hill Companies, 2003. – 826 p.3.

15. Electronic resources, including the Internet

1. Clinical Express Diagnostics In Healthcare. – URL: <https://www.ncbi.nlm.nih.gov/pubmed/>
2. Manual of Laboratory and Diagnostic Tests 7th edition (July 2003): By Frances T Fischbach RN, BSN, MSN By Lippincott Williams & Wilkins Publishers. – URL: <https://murdercube.com/files/Survival/Medical/Labs>
3. Library of Kharkov National University of Pharmacy — <http://www.library@nuph.edu.ua>.
4. Kharkiv State Library of Medicine — <http://www.kh.med.bibc@ukr.net>.
5. Kharkov State Scientific Library. VG Korolenko.
6. Specialized medical and biological internet portals — www.emed.org.ua.
7. PubMed – <https://pubmed.ncbi.nlm.nih.gov>