STATE HIGHER EDUCATION UNIVERSITY
"UZHGOROD NATIONAL UNIVERSITY"
MEDICAL FACULTY №2
DEPARTMENT OF INTERNAL DISEASES

«APPROVED»
Dean of medical faculty №2
/V.V. Kaliy/
«30» 06 2021 year

SYLLABUS OF THE EDUCATIONAL DISCIPLINE

OK 29 Laboratory diagnostics in clinical medical practice

Academic degree II (Master study)

Direction of training 22 «Health care»
(code and name of the direction of training)

Specialty 222 «Medicine»
(code and name of the specialty)

Educational discipline Medical Care

Specialization n\a
(name of the specialization)

institute, faculty, department Medical faculty №2
(name of the institute, faculty, department)

status of discipline compulsory

language of study English

Uzhgorod, 2021 – 2022 academic year

Syllabus of the educational discipline «Laboratory diagnostics in clinical medical practice » for higher educational applicants in direction of training 22 «Health care» Specialty 222 «Medicine» educational discipline «Medical Care», the 4th year of study.

Developers: Tovt-Korshynska M.I., D.Med.Sci., Professor, Head of the Internal Diseases Department; Hanych O.T.. Ph.D., Associate Professor of the Internal Diseases Department.

The syllabus had been approved on the Chair meeting of Internal diseases department

Protocol dated 15.06.2021 № 10

Head of the Department _____(Tovt-Korshynska M.I._____)

(Signature) (Surname and initials)

Approved by academic standarts commission of medical faculty №2

Form № H - 3.04

Protocol dated 29.06.2021 № 6

Head of academic standarts commission Malets N.B

1. DESCRIPTION OF THE EDUCATIONAL DICIPLINE

Indicator name	**Form of education**
	Daytime form
Credits ECTS –1	Year of study: 4th
Hours – 20	
Modules –1	Semester: 7 th
Hours per week for daytime form: classroom –2	
	Lectures: -
	Practical class: 20
Type of final control: credit	Laboratory class: -
Form of final control: combined	Self- guided work

2. THE PURPOSE OF DISCIPLINE

The purpose and objectives of discipline «Laboratory diagnostics in clinical medical practice» is the achievement of the main goals determined in the educational and professional program of the specialist's training on the "Medicine".

According to educational discipline, study of discipline leads to competence formation in educational applicants:

GC 1. Ability to abstract thinking, analyzing and synthesizing information.
GC 2. Ability to learn and master modern fields of knowledge.
GC 3. Ability to apply knowledge in practical situations.
GC 4. Knowledge and understanding of the subject area and understanding of professional activity.
GC 5. The ability to adapt and act in a new situation.
GC 6. Ability to make informed decisions.
GC 8. Interpersonal skills.
GC 11.Use of information and communication technologies.
GC 12.Definition and perseverance about tasks and responsibilities.
GC 13.The ability to act socially responsible and consciously.
GC 15. Ability to act on the basis of ethical considerations (motives).

PC 1. The ability to establish a preliminary clinical diagnosis of the disease.
PC 2. Skills in collecting information about patient.
PC 3. Ability to evaluate the results of laboratory and
instrumental studies.
PC 19. Ability to process state, social, economic and medical information

The work program of the elective course "Laboratory diagnostics in clinical medical practice" is designed to prepare medical students of the 5th year of study.

The main aim of the cycle is the further improvement of theoretical knowledge, practical skills and knowledge of the clinical interpretation of the results of studies of the differential diagnosis of diseases that are accompanied by disturbances of blood. The objectives of the course are to familiarize students with the interpretation of changes in the general analysis of blood, urine, biochemical and serological studies of blood serum, as well as the development of interest in further independent study of this discipline, new methods of laboratory diagnostics.

The discipline program includes leading sections and topics related to laboratory research in clinical medicine.

Practical classes are conducted in the learning process to complete this program. At the end of the course a credit is taken.

As a result of studying the discipline, the student must
know:
1. Norms of laboratory indicators of blood and urine tests.
2. Deviation of indicators of blood and urine in diseases of internal organs.
3. Methods of performing basic laboratory tests.
4. Methods of performing rapid tests.

be able to:
1. Interpret changes in the overall blood test.
2. Determine the type of anemia or tumor diseases of the blood using data from a general blood test.
3. Interpret urine test results.
4. To evaluate the indices of carbohydrate metabolism by the results of biochemical blood test.
5. To evaluate lipid metabolism indices on the results of biochemical blood test.
6. To evaluate indicators of protein metabolism by the results of biochemical blood testing.
7. To evaluate pigment metabolism indices on the results of biochemical blood test.
8. Interpret changes in quantity of serum enzymes.

9. Determine markers of necrosis of the heart muscle, left ventricular dysfunction and pulmonary embolism.
10. Evaluate the impact of drugs on laboratory blood parameters.
11. Carry out screening of autoimmune diseases through laboratory tests.

3. PREREQUISITES FOR STUDYING THE DISCIPLINE

Prerequisites for studying discipline «Laboratory diagnostics in clinical medical practice» are mastering the following educational subjects (ES) of the educational program (EP):

Code ES – "Physiology" – OK-14 (**14.03.03)**

Code ES – "Pathophysiology" – OK-19 (**14.03.04)**

4. EXPECTED RESULTS OF EDUCATION

According to the educational program «Laboratory diagnostics in clinical medical practice», study of the educational program of discipline must ensure the achievement of higher education applicants such prognostic results of education (PRE):

Prognostic results of education of the discipline	Code PRE
Collect data about patient complaints, medical history, family history, conduct and evaluate physical examination results.	PRE 1
Evaluate diagnosis information using a standard procedure based on laboratory and instrumental findings.	PRE 2
Highlight a leading clinical symptom or syndrome. Establish the most probable or syndromic diagnosis of the disease. To prescribe laboratory and / or instrumental examination of the patient. To carry out differential diagnostics of diseases. Establish a preliminary and clinical diagnosis.	PRE 3
Formulate goals and determine the structure of personal activity.	PRE 21
To be aware and guided in the activity by civil rights, freedoms and obligations, to raise the general cultural level.	PRE 23
Comply with ethics, bioethics and deontology requirements their professional activity.	PRE 24

Expected results of education that must be achieved by students after mastering the discipline "Laboratory diagnostics in clinical medical practice":

Code ERE	Expected results of education of the discipline	Code PRE
ERE 1	Ability to collect data about patient complaints, medical history, family history, conduct and evaluate physical examination results	PRE 1
ERE 2	Ability to evaluate diagnosis information using a standard procedure based on laboratory and instrumental findings.	PRE 2

ERE 3	Ability to highlight a leading clinical symptom or syndrome. Establish the most probable or syndromic diagnosis of the disease. To prescribe laboratory and / or instrumental examination of the patient. To carry out differential diagnostics of diseases. Establish a preliminary and clinical diagnosis.	PRE 3
ERE 21	Ability to formulate goals and determine the structure of personal activity.	PRE 21
ERE 23	Awareness and management the activity by civil rights, freedoms and obligations, to raise the general cultural level.	PRE 23
ERE 24	Ability to comply with ethics, bioethics and deontology requirements their professional activity.	PRE 24

5. ASSESSMENT TOOLS AND METHODS FOR DEMONSTRATING RESULTS OF EDUCATION:

Assessment tools and methods for demonstrating results of education of discipline are:

- current control;
- module control;
- final control.

Forms of control and criteria for evaluating educational results

Forms of current control: oral answering, test control, clinical tasks, control work.
Forms of module control: tests, written control.
Forms of final control: exam/credit.

The distribution of points that students can get

Routine testing and individual work									Total
T 1	T 2	T 3	T 4	T 5	T6	T7	T8	T9	135
15	15	15	15	15	15	15	15	15	
The final module control									65
Total									200

T1, T2, T... – topics.
Minimum passing point for PC is 68 points, for the FMC – 33 points.

Assessment of individual types of educational work in the discipline

Type of educational work	Module 1	
		Max. points
Practical classes		135
The final module control		65
Total Points		200

Assessment criteria for module and final module control

Final module conducted in the form of credit. The maximum score is 200 points (total points for mastering current topics, module tests, presentations). Students who have scored 120 or more are considered to have passed the module and are given a rating scale ECTS ranging from A to E.

Rating scale: national and ECTS

Total points for all kinds of educational activity	ECTS	National scale	
		For differentiated credit	For credit
180 – 200	A	Excellent	Credit
164 – 179	B	Good	
148 – 163	C		
128 – 147	D	Satisfactory	
120 – 127	E		
70 – 119	FX	Unsatisfactory	Re-taking the exam
0 – 69	F	Unsatisfactory with re-studying the course	Mandatory re-studying the course

6. THE PROGRAM OF THE COURSE

6.1 Contents of the course

Content module 1. The value of laboratory diagnostics for clinical medicine.

Topic1.

Urine examination. Changes in urine due to diseases of internal organs and systems.

Topic 2.

Complete blood count. The rate, physiological and pathological abnormalities of each indicator.

Content module 2. Biochemical blood test interpretation.

Topic 3.

Changes in lipid (total blood cholesterol, low-density lipoproteins, high-density lipoproteins, triglycerides, phospholipids), carbohydrate (blood glucose, glycated proteins: glycohemoglobin, fructosamine, sugar-loaded sample, galactose, D-xylose) metabolism.

Topic 4.

Changes in protein (serum proteins, protein fractions, thymol sample) and pigment (total, free, conjugated bilirubin) metabolism.

Content module 3. Laboratory diagnostics in gastroenterology.

Topic 5.

Enzyme studies (alanine aminotransferase ALT, aspartate aminotransferase ACAT, cholinesterase HE, alkaline phosphatase LF, gamma-glutamyltranspeptidase GGTP, lactate dehydrogenase LDH).

Topic 6.

Serological diagnosis of viral hepatitis:

- B (HBsAG,HBeAg,HBcAg, anti-HBc, Ig M anti-HBe, HBV DNA);
- D (IgM anti-HDV, IgG HDV, HDAg, HDV-RNA);

- C (anti-HCV core IgM, anti-HCV core IgG, HCV-RNA);
- G (HGV-RNA);
- TTV (TTV-DNA);

Diagnosis of autoimmune hepatitis (ANA antinuclear antibodies, SMA smooth muscle antibodies, ANCA cytoplasmic antibodies, microsomal anti-LKM-1, LKM-3 antibodies, antibodies to soluble hepatic anti-SLA antigen).

Serological diagnosis of celiac disease (antibodies to gliadin IgG, IgA, antibodies to tissue transglutaminase tTGA).

Serological diagnosis of atrophic gastritis (serum pepsinogen-1, serum gastrin-17).

Serological diagnosis of Helicobacter bacteriasis (serum antigelicobacterial Ig G, IgA, IgM).

Content module 4. Laboratory diagnostics in cardiology.

Topic 7.

Serum markers of myocardial necrosis (cardiac troponin T, I, creatinine phosphokinase, CFKK fraction, lactate dehydrogenase, myoglobin).

Laboratory diagnostics of left ventricular dysfunction (circulating atrial brain natriuretic peptide and its N-terminal fragment = NT-MNUP) and pulmonary embolism (D-dimer).

Topic 8.

Coagulogram.

Content module 5. Laboratory diagnostics in rheumatology.

Topic 9.

Estimation of acute-phase inflammation indicators (C-reactive protein, sialic acids, proinflammatory cytokines = interleukins 1, 6, tumor necrosis factor ∝).

Serological diagnosis of systemic lupus erythematosus (LE cells, antibodies to native helical DNA), scleroderma (oxyproline, anti-Scl-70, anticentromeric antibodies), scleroderma (oxyproline, anti-Scl-70, anti-centromeric antibodies), rheumatoid arthritis (rheumatoid factor, anti-nuclear antibodies, antiphospholipid antibodies, antibodies to vimentin), systemic vasculitis (anti-neutrophil cytoplasmic antibodies, anti-endothelial antibodies), rheumatism (antistreptolysin-O, antistreptogialuronidase, antistreptokinase, antistreptodeoxyribonuclease).

Final test for the course of "Current issues of laboratory diagnostics in clinical medical practice".

6.2. Structure of discipline

Names of content modules and themes	Number of hours											
	Full-time						Part-time					
	all	including					all	including				
		L	PC	LC	IT	IW		L	PC	LC	IT	IW
1	2	3	4	5	6	7	8	9	10	11	12	13
Content module 1.												
Total hours for Module 1	4		4									
Content module 2.												
Total hours for Module 2	4		4									
Content module 3.												
Total hours for Module 3	4		4									
Content module 4.												

Total hours for Module 4	4		4									
Content module 5.												
Total hours for Module 5	2		2									
Individual task												
Final test			2									
Total hours	20		20									

6.3. Topics of practical classes

No.	Topic name	Hours
1.	Urine examination. Changes in urine due to diseases of internal organs and systems.	2
2.	Complete blood count. The rate, physiological and pathological abnormalities of each indicator.	2
3.	Changes in lipid, carbohydrate metabolism.	2
4.	Changes in protein and pigment metabolism.	2
5.	Enzyme studies.	2
6.	Serological diagnosis of viral autoimmune hepatitis, celiac disease and gastritis.	2
7.	Serum markers of myocardial necrosis. Laboratory diagnostics of left ventricular dysfunction and pulmonary embolism.	2
8.	Coagulogram.	2
9.	Laboratory diagnostics in rheumatology.	2
	Final module control	2

6.4. Individual tasks (student scientific work, report at the student scientific conference**).**

7. Teaching Methods

There are the following teaching methods according to the syllable:

1. Practical classes
2. Individual work of the students
3. Individual tasks for the students

The curriculum of practical classes and individual work of the students provide the understanding of all the topics inside content modules.

8. RECOMMENDED SOURCES OF INFORMATION

Basic literature

1. Clarke, W. and Dufour, D. R., Editors (2016). Contemporary Practice in Clinical Chemistry, AACC Press, Washington, DC. Harris, N. and Winter, W.;
2. Physician's Guide to the Laboratory Diagnosis of Metabolic Diseases. Nenad Blau, Marinus Duran, Milan E. Blaskovics, K. M. Gibson;
3. The Science of Laboratory Diagnosis. David Burnett, John Crocker;

Additional references

1. Henry's Clinical Diagnosis and Management by Laboratory Methods. Richard A. McPherson, Matthew R. Pincus

Information resources on the Internet

1. **https://www.scirp.org/journal/AER/**
2. **https://www.scirp.org/journal/IJCM/**
3. **https://www.scirp.org/journal/OJBD/**
4. **https://www.scirp.org/journal/OJGas/**
5. **https://www.scirp.org/journal/OJIM/**
6. **https://www.scirp.org/journal/OJRA/**
7. **https://www.scirp.org/journal/WJCD/**

Addition

View results
work program of the discipline

Syllabus rebooted till 20___ / 20___ y. unchanged; with changes (Addition ___).
(should be emphasized)

Protocol № ____ dated «____» _____ 20 ___ y.
Head of the Internal Diseases Department _____ Tovt-Korshynska M.I.

Syllabus rebooted till 20___ / 20___ y. unchanged; with changes (Addition ___).
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