MINISTRY OF HEALTH OF UKRAINE

KHARKIV NATIONAL MEDICAL UNIVERSITY

APPROVE
Acting vice-rector for scientific and pedagogical work

_____
Associate Professor I.V. Leshchina

_____ 2021

Department of clinical laboratory diagnostics

SYLLABUS OF THE COURSE
„Clinical Assessment of Laboratory Tests"

(name of the discipline)

academic year 2021/2022

field of knowledge 22 «Healthcare»
(code and name of the field of knowledge)

Specialty 221 "Medicine"
(code and name of the specialty)

Course 5 th, dental faculty

The syllabus of the discipline was approved at the meeting of the department of clinical laboratory diagnostics

Protocol from
"30" August 2021 № 1

Head of department
_____ Zalubovska O.I.
(signature) (surname and initials)

"30" August 2021

Approved by the methodical commission on problems of Professional Educational in therapeutic profile of KhNMU

Protocol from
" 31 " August 2021 № _1_
Head
_____ professor Kravchun P.G.
(signature) (surname and initials)

"_31_" August 2021

Developer: Prof. **Zalubovska O. I.** associate professor **Avidzba Yu. N.**

Developer: Prof. **Zalubovska O. I.** associate professor **Avidzba Yu. N.**

Information about the teacher who teaches the discipline

Last name, first name, patronymic	**Avidzba Yuli Nalikovna**
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Schedule of classes	According to the schedule
Consultations / testing	Full-time: according to the schedule of works at the department / by prior arrangement Online: on the Moodle platform, on the ZOOM platform according to the schedule E-mail for operative contact concerning working off: kaf.4med.labdiahnostyky@knmu.edu.u

1. Description of the academic discipline

The syllabus of the academic discipline "**Clinical Assessment of Laboratory Tests**" for the higher medical institutes of education of Ukraine is compiled for the specialty 222 «Medicine» of the educational program 22 “Health care” in accordance with the educational-professional program.

The subject matter "**Clinical Assessment of Laboratory Tests**" is studying of the indexes of the blood, urine, digestive system in the norm and during diseases, changing of indexes of the blood, urine, digestive system.

The aim and objectives of the academic discipline

Teaching goal of a subject "**Clinical Assessment of Laboratory Tests**" is the introduction into 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 doctors.

Basic goals of a subject "**Clinical Assessment of Laboratory Tests**" is to familiarize students with the principles of organization and operation of laboratory and diagnostic facilities of different types; to provide a knowledge about the rationale of laboratory diagnosis, which will be required in the professional competence and general erudition a doctors; assess the facts in evidence in laboratory parameters in scientific publications.

Competence and intended learning outcomes

Discipline **«Clinical Assessment of Laboratory Tests»** provides for acquisition of the following competencies by higher education students:

1. basic knowledge about management in health care, in laboratory medicine, management structure in the health care system, managerial role of the manager, managerial decisions, scientific and practical approaches to the selection and placement of managerial personnel;
2. basic knowledge about the information management, licensing and accreditation in the healthcare system, in the laboratory service;
3. basic knowledge of conflicts, scientific and practical approaches to the selection and placement of managerial personnel;
4. basic knowledge about the health care economy, basic methods of marketing management, market mechanism of the functioning of the laboratory system, methodology for calculating the cost of laboratory studies;
5. basic knowledge about the study of indicators of the laboratories in accordance with the standards;

6. basic knowledge about methods of recording and collecting medical-statistical information, methods of its processing;
7. basic knowledge in the field of computer science and modern information technologies;
8. the skills of using software and computer skills, the ability to create databases and use Internet resources.

As a result of learning activities a higher education students have to ***know:***

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

be able to:

12. assess the information content of biological material for research in laboratories;
13. interpret the results of laboratory tests of blood, urine, feces, sputum, gastrointestinal contents;
14. interpret the erythrocyte parameters of clinical blood to detect anemic syndrome;
15. interpret laboratory parameters of clinical blood to detect the inflammation;
16. to characterize the factors that may influence the biomaterial;
17. 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.

acquire:

18. technologies of microscopy, photoelectric calorimetry, spectrophotometry, chromatography, gas chromatography, atomic absorption, polarography, inversion voltammetry, etc.
19. methods of conducting medical documentation

2. Detailed Subject Outline

Introduction into laboratory diagnostics. Laboratory research methods of blood, urine. Methods of investigation of sputum and gastrointestinal tract.

Topic 1. The organization workplace for laboratory conduct research of blood. The composition and functions of blood. Erytrocytopoesis, morphology of red blood cells, white blood cells, neutrophils, platelets. Determination of blood groups. Blood sampling guidelines for general clinical analysis. The method of determining the number of erythrocytes, concentration of hemoglobin, color index, leukocyte formula, erythrocyte sedimentation rate. Finger puncture technology. Scheme of blood maturation. Embryonic and postembryonic hematopoiesis. Leukocytopoesis. Age-related changes in blood composition. The functions of leukocytes. Quantitative changes of white blood cells,

leukocytosis and leukopenia. Leukemoid reaction. Neutrocytosis. Neutropenia. Neutrophilic shift of leukogramme. Trombosytopoesis.

Topic 2. The anemia classification. Laboratory indexes. Differential diagnosis. Side effects of medications that affect the blood system. Drugs and pathology of blood. Etiology, pathogenesis. Clinical manifestations. Characteristics. Laboratory indexes. Differential diagnosis. Basic mechanisms of drug-induced anemia. Drugs used to stimulate erythropoiesis. Iron preparations. Vitamin Bi_2 and folic acid. Drugs that often cause inhibition of leucopoiesis. Medications recommended to stimulate leucopoiesis. Medications which often inhibit platelet function. Anticoagulants, antiplatelet agents, fibrinolytics. Hemostatic drugs. Adverse hematologic effects of different groups of drugs.

Topic 3. The research of physical and chemical properties of urine. Methods of diagnostics. Number, color, clarity, smell, relative density. The physical properties of urine in norm and changes it due to pathology. Proteinuria, glucosuria, bilirubinemia, causes and types. Microscopic examination of urine sediment. Quantitative methods urine sediment. Urine sediment elements: red blood cells, white blood cells, the epithelium, cylinders. The rules and terms of collecting urine, sequence of studies, interpretation of results. Elements unorganized sediment urine: acidic, alkaline, abnormal urine. Method of Nechyporenko.

Topic 4. Determination of physical properties of sputum. Side effects of drugs that affect the function of the respiratory system. Medicines that cause destruction of the respiratory system. Number, color, odor, texture, stickiness, foam. Microscopic examination of sputum. Epithelium, leukocytes, erythrocytes, formation of fibrous crystals, foreign bodies. Bacterioscopic sputum. Koch bacillus, fungi, protozoa, helminthes. Changes of sputum due to various diseases. Bronchitis, asthma, bronchiectasis, pneumonia, lung abscess, echinococcosis, tuberculosis. Diagnostic value methods. Medicines that stimulate respiration, antitussives, expectorants. Classification. Comparative characteristics of preparations. The most commonly expected adverse effects of drugs. Combined use of expectorant and antitussive agents. Side effects of drugs that affect the function of the respiratory system that affect the function of the respiratory system. Medicines that cause destruction of the respiratory system. Medications used to treat asthma.

Topic 5. Clinical and laboratory study of the gastrointestinal tract. General information about the structure and functions of the gastrointestinal tract. Chemical research of secretory function of the stomach. Volume, color, odor, slime. Physical secretory function of the stomach. Characteristics. Research methods (probe, non-probe). Research of stomach acidity: determination of acidity due to using pH measuring. Diagnostic significance of excess and deficit of hydrochloric acid, basal and maximum secretion of alkaline component secretion. Enzymatic activity of the stomach.

3. Description of the discipline

<table>
<tr><td rowspan="2">Name of indicators</td><td rowspan="2">Branch of knowledge, direction of training, educational and qualification level</td><td colspan="2">Characteristics of the discipline</td></tr>
<tr><td>full-time education</td><td>evening form of training</td></tr>
<tr><td>Amount of credits – 1,0</td><td>Direction of preparation 22 “Health care” (cipher and name of the training area)</td><td colspan="2">Optional</td></tr>
<tr><td rowspan="2">The total number of hours is 30</td><td rowspan="2">Specialty 222 «Medicine» (cipher and specialty name)</td><td colspan="2">Year of training: 4th</td></tr>
<tr><td colspan="2">Semester 8th</td></tr>
<tr><td rowspan="8">Hours for full-time education:
classroom – 20
Independent student work – 10</td><td rowspan="8">Education level: Specialist</td><td colspan="2">Lectures – 0</td></tr>
<tr><td colspan="2">Practical, seminars</td></tr>
<tr><td>20 h.</td><td>--------</td></tr>
<tr><td colspan="2">Laboratory</td></tr>
<tr><td colspan="2">----------</td></tr>
<tr><td colspan="2">Independent work – 10 h.</td></tr>
<tr><td colspan="2">Individual tasks – 0 h.</td></tr>
<tr><td colspan="2">Type of control:
Current control</td></tr>
</table>

The ratio of the number of hours of classroom studies to independent and individual work is for the full-time form of training - 2 to 1 (20/10).

4. Structure of the academic discipline

Names of substantial modules and topics	**Hours**					
	Intramural Program					
	total	**including**				
		lect.	sem.	pract.	lab.	ind. work
Topic 1. The organization workplace for laboratory conduct research of blood. The composition and functions of blood. Erytrocytopoesis, morphology of red blood cells, white blood cells, neutrophils, platelets. Determination of blood groups. Blood sampling guidelines for general clinical analysis. The method of determining the number of erythrocytes, concentration of hemoglobin, color	6	0	0	4		2

index, leukocyte formula, erythrocyte sedimentation rate. Finger puncture technology. Scheme of blood maturation. Embryonic and postembryonic hematopoiesis. Leukocytopoesis. Age-related changes in blood composition. The functions of leukocytes. Quantitative changes of white blood cells, leukocytosis and leukopenia. Leukemoid reaction. Neutrocytosis. Neutropenia. Neutrophilic shift of leukogramme. Trombosytopoesis.						
Topic 2. The anemia classification. Laboratory indexes. Differential diagnosis. Side effects of medications that affect the blood system. Drugs and pathology of blood. Etiology, pathogenesis. Clinical manifestations. Characteristics. Laboratory indexes. Differential diagnosis. Basic mechanisms of drug-induced anemia. Drugs used to stimulate erythropoiesis. Iron preparations. Vitamin Bi_2 and folic acid. Drugs that often cause inhibition of leucopoiesis. Medications recommended to stimulate leucopoiesis. Medications which often inhibit platelet function. Anticoagulants, antiplatelet agents, fibrinolytics. Hemostatic drugs. Adverse hematologic effects of different groups of drugs.	6	0	0	4		2
Topic 3. The research of physical and chemical properties of urine. Methods of diagnostics. Number, color, clarity, smell, relative density. The physical properties of urine in norm and changes it due to pathology. Proteinuria, glucosuria, bilirubinemia, causes and types. Microscopic examination of urine sediment. Quantitative methods urine sediment. Urine sediment elements: red blood cells, white blood cells, the epithelium, cylinders. The rules and terms of collecting urine, sequence of studies, interpretation of results. Elements unorganized sediment urine: acidic, alkaline, abnormal urine. Method of Nechyporenko.	6	0	0	4		2
Topic 4. Determination of physical properties of sputum. Side effects of drugs that affect the function of the respiratory system. Medicines that cause destruction of the respiratory system. Number, color, odor, texture, stickiness, foam. Microscopic examination of	6	0	0	4		2

sputum. Epithelium, leukocytes, erythrocytes, formation of fibrous crystals, foreign bodies. Bacterioscopic sputum. Koch bacillus, fungi, protozoa, helminthes. Changes of sputum due to various diseases. Bronchitis, asthma, bronchiectasis, pneumonia, lung abscess, echinococcosis, tuberculosis. Diagnostic value methods. Medicines that stimulate respiration, antitussives, expectorants. Classification. Comparative characteristics of preparations. The most commonly expected adverse effects of drugs. Combined use of expectorant and antitussive agents. Side effects of drugs that affect the function of the respiratory system that affect the function of the respiratory system. Medicines that cause destruction of the respiratory system. Medications used to treat asthma.						
Topic 5. Clinical and laboratory study of the gastrointestinal tract. General information about the structure and function of the gastrointestinal tract. Chemical research of secretory function of the stomach. Volume, color, odor, slime. Physical secretory function of the stomach. Characteristics. Methods of examination (probe, nonprobe). Research of stomach acidity: determination of acidity due to using pH measuring. Diagnostic significance of excess and deficit of hydrochloric acid, basal and maximum secretion of alkaline component secretion. Enzymatic activity of the stomach.	6	0	0	4		2
Total hours	30	0	0	20		10

1. Topics of lectures

S No.	Title of the topic	**Hours**
1	----------	
2	----------	
...	----------	
Total hours		0

7. Topics of seminars

S No.	Title of the topic	**Hours**
1	----------	
2	----------	
...	----------	
Total hours		0

8. Practical classes topics

S No.	Title of the topic	**Hours**
1	**Topic 1.** The organization of the workplace for laboratory conduct research of blood. The composition and functions of blood. Erytrocytopoesis, morphology of red blood cells, white blood cells, neutrophils, platelets. Determination of blood groups	4
2	**Topic 2.** The anemia classification. Laboratory indexes. Differential diagnosis. Side effects of medications that affect the blood system. Drugs and pathology of blood.	4
3	**Topic 3.** The research of physical and chemical properties of urine. Methods of diagnostics.	4
4	**Topic 4.** Determination of physical properties of sputum. Side effects of drugs that affect the function of the respiratory system.	4
5	**Topic 5.** Clinical and laboratory study of the gastrointestinal tract.	4
Total hours		20

9. Laboratory Practical topics

S No.	Title of the topic	**Hours**
1	----------	
2	----------	
...	----------	
Total hours		0

10.Individual Work

S. No.	Title of the topic	Hours
		Intramural Program
1	The organization of the workplace for laboratory conduct research of blood. The composition and functions of blood. Erytrocytopoesis, morphology of red blood cells, white blood cells, neutrophils, platelets. Determination of blood groups.	2
2	The anemia classification. Laboratory indexes. Differential diagnosis. Side effects of medications that affect the blood system. Drugs and pathology of blood.	1
3	The research of physical and chemical properties of urine.	1
4	The changes of urine indicators due to infectious and inflammatory process and kidney disease. Side effects of drugs that affect the function of the urinary system. Drugs and pathology of the urinary system.	1
5	Determination of physical properties of sputum. Side effects of drugs that affect the function of the respiratory system that affect the function of the respiratory system. Medicines that cause destruction of the respiratory system.	1
6	Physical secretory function of the stomach.	1
7	Side effects of drugs that affect the function of the digestive system. Drugs and pathology of the gastrointestinal tract.	1
8	Macroscopic examination of feces.	1
9	Recommendations Maastricht Conference (2010) on the eradication of Helicobacter pylori.	1
Total hours		10

10. Individual classes

Not foreseen by the working curriculum.

11. Methods of training

1. Practical classes.
2. Business games.
3. Independent work with the use of textbooks, manuals, educational and methodological recommendations, additional literature, the Internet.

12. Control methods

The form of final control of the discipline "Clinical Laboratory Diagnosis" is a score based on the results of the assessment of current activity and expressed on a two-point scale: "enrolled" or "not enrolled".

13. Recalculation of the average for current activity in a multi-scale scale

Method of conducting control measures

Current control is carried out on every practical lesson according to the specific goals of each topic. At each practical lesson, the student answers 15 tests on the topic of practical classes, standardized questions, knowledge of which is necessary for understanding the current topic of independent work related to the current occupation; demonstrates knowledge according to the topic of practical training.

Criteria for assessing student's current academic activity

At each practical lesson, the teacher assesses the knowledge of each student in a four-point system.

At each practical lesson, the student's knowledge is evaluated according to the four-point system ("5", "4", "3", "2") according to the criteria for assessing the student's current activity.

Obtained scores are converted to corresponding scores. Conducted in accordance with "Instructions for assessing the student's academic activity ..."

4-scores	200-scorec
5	200
4.97-4,99	199
4.95-4,96	198
4.92-4,94	197
4.9-4,91	196
4.87-4,89	195
4.85-4,86	194
4.82-4,84	193
4.8-4,81	192
4.77-4,79	191
4.75-4,76	190
4.72-4,74	189
4.7-4,71	188
4.67-4,69	187
4.65-4,66	186
4.62-4,64	185
4.6-4,61	184
4.57-4,59	183
4.54-4,56	182
4.52-4,53	181
4.5-4,51	180
4.47-4,49	179
4.45-4,46	178
4.42-4,44	177
4.4-4,41	176
4.37-4,39	175
4.35-4,36	174
4.32-4,34	173
4.3-4,31	172
4,27-4,29	171
4.24-4,26	170

4-scores	200-scorec
4.22-4,23	169
4.19-4,21	168
4.17-4,18	167
4.14-4,16	166
4.12-4,13	165
4.09-4,11	164
4.07-4,08	163
4.04-4,06	162
4.02-4,03	161
3.99-4,01	160
3.97-3,98	159
3.94-3,96	158
3.92-3,93	157
3.89-3,91	156
3.87-3,88	155
3.84-3,86	154
3.82-3,83	153
3.79-3,81	152
3.77-3,78	151
3.74-3,76	150
3.72-3,73	149
3.7-3,71	148
3.67-3,69	147
3.65-3,66	146
3.62-3,64	145
3.6-3,61	144
3.57-3,59	143
3.55-3,56	142
3.52-3,54	141
3.5-3,51	140
3.47-3,49	139

4-scores	200-scorec
3.45-3,46	138
3.42-3,44	137
3.4-3,41	136
3.37-3,39	135
3.35-3,36	134
3.32-3,34	133
3.3-3,31	132
3.27-3,29	131
3.25-3,26	130
3.22-3,24	129
3.2-3,21	128
3.17-3,19	127
3.15-3,16	126
3.12-3,14	125
3.1-3,11	124
3.07-3,09	123
3.05-3,06	122
3.02-3,04	121
3-3,01	120
Less than 3	Not enough

The final lesson's support is conducted in accordance with the working curriculum of discipline (hereinafter - RNPD) on schedule, during classes.

The department should provide the following materials for preparation for the methodical support on the information stand:

- basic and anchor test tasks (integrate licensing exam (ILE) "Krok");
- a list of theoretical issues (including issues of independent work);
- a list of practical skills;
- list of drugs, recipes to be prescribed by the student;
- list of accounting medical documents;
- criteria for assessing the knowledge and skills of students;
- schedule of students' training during the semester.

Conducting the final lesson:

Method of conducting the final lesson.

1. Solving a set of test tasks in the content of the training material, which includes the following: basic test tasks on discipline covering the contents of the training material of the final lesson in accordance with the RNPD in the amount of not less than 30 tests (for the disciplines that are part of the LII "Krok" - an open base of test tasks of the ILE "Krok" The evaluation criterion is 90,5% of correctly solved tasks; "folded" or "failed");

2. Assessment of mastering of practical skills (evaluation criteria - "fulfilled" or "failed").

3. Tasks for practical and vocational training, reflecting the evaluation of the results of laboratory research methods, which are defined in the lists of work syllabus of disciplines (RNPD) and OCX specialties.

4. When assessing the student's knowledge in this final training session (CP), a student is assessed on a national scale, which is counted as an estimate for the IPA.

Discipline policy and values

Discipline requirements (a system of requirements and rules, the teacher presents to applicants for higher education in the study of the discipline).

According to the current "Instructions for the assessment of educational activities under the European credit transfer system of the organization of the educational process", students must receive an assessment for each topic of the discipline. If a student missed a class, he worked it out in accordance with the "Regulations on the procedure for working out by students of the Kharkov National Medical University of study." Working off is taken daily by the duty teacher of the department.

In the event that the student did not pass the individual assignment on time for a good reason, it is necessary to inform the teacher about this situation and set a new deadline. If a student does not have time to complete an individual assignment, he can ask the teacher to postpone the deadline with a justification for the reason for the untimely performance (the teacher decides in each specific situation it makes sense to extend the deadline and for how long).

In case of non-fulfillment of tasks during training sessions, or non-fulfillment of part of such a lesson, the teacher gives an unsatisfactory grade, which the student must retake to the teacher in the teacher's free time and the student, who should be pre-appointed.

During the lecture, students are encouraged to take notes of the lesson and maintain a sufficient level of silence.

During practical classes, a sufficient level of preparedness of students for them and active participation in the work and implementation of the tasks set by the teacher is expected. In particular, active participation in the discussion in the classroom is expected, students should be ready to understand in detail the material, ask questions, express their point of view, and discuss. During classes, it is important:

- respect for colleagues, politeness and good manners,
- tolerance towards others and their experiences,
- sensitivity and impartiality,
- the ability to disagree with opinions, but respect the personality of the opponent,
- careful argumentation of your opinion and the courage to change your position under the influence of evidence,
- I-statements, when a person avoids unnecessary dressing, describes his feelings and formulates his wishes based on his own thoughts and emotions,
- compulsory acquaintance with primary sources, readiness for the lesson.

Creative approach in its various forms is encouraged. Students are expected to be interested in participating in various scientific and communication activities in the subject profile.

Attendance and behavior (inadmissibility of absences, tardiness, requirements regarding clothing, medical examination, etc.).

It is important for students to follow the rules of proper conduct at the university. These rules are general for everyone, they also apply to the entire faculty and staff / -ts, and do not fundamentally differ from generally accepted norms. During classes, students must wear medical gowns (professional clothing).

During classes it is prohibited:

- to leave the audience for a short time if necessary and with the permission of the teacher;
- to drink water;
- to take pictures of presentation slides;
- actively participate in the lesson.

Prohibited:

- to eat (except for persons whose special medical condition requires another - in this case, medical confirmation is required)
- to smoke, consume alcoholic and even low-alcohol drinks, other drinks besides water, as well as drugs;
- to use obscene language or use words that offend the honor and dignity of colleagues and faculty;
- to play games;
- to harm the material and technical base of the university (damage inventory, equipment; furniture, walls, floors, litter premises and territories)

- to make noise, shout or listen to loud music in classrooms and even corridors during class.

Use of electronic gadgets. The use of electronic gadgets during face-to-face classes in the classroom is allowed and encouraged when performing situational tasks, participating in business games, etc., or considering new material with a teacher. The use of any gadgets during interviews, testing or other control activities is strictly prohibited. At this time, they should be in bags, backpacks, etc.

Academic virtue policy (including liability for violation of academic virtue).

Successful completion of the course requires observance of academic virtue, knowledge and ability to use in preparation for classes and performing tasks Regulations on the procedure for checking text documents at Kharkiv National Medical University - dissertations, research reports, scientific publications, materials from scientific forums, educational literature, educational and methodological publications and teaching aids for the presence of text borrowings.

Safety engineering.

In the first lesson of the course, the basic principles of labor protection will be explained by conducting appropriate briefing. It is expected that each and every one should know where the emergency exit closest to the audience is, where the fire extinguisher is located, how to use it, and the like.

The procedure for informing about changes in syllabus , etc.

When changes are made to the syllabus of the discipline, the corresponding announcement will be made by the teacher at the first lesson in the discipline and the updated power of the beads will be posted on the electronic resources of the department and the university.

Assessment policy

Individual assignments

Individual work of students under the guidance of a teacher in the discipline "Social medicine, public health and the basics of evidence-based medicine" is carried out during the semester in the form of: study of literary sources recommended for the development of topics and problems and preparation of reports on them; study of normative documents recommended for the study of various topics of the discipline; fulfillment of individual tasks.

Individual creative work is carried out by the student independently with the advice of a teacher, subject to their need. The performance of the work involves the search and processing by the student of theoretical, analytical and statistical material on research issues, its study and systematization, the generalization of the results obtained, the implementation of generalizations and the formulation of reasonable conclusions. Tasks for individual creative work are selected by the student from the list suggested by the teacher. Individual creative work should be structured, deeply reveal the topic of research and meet the established design requirements.

Elimination of academic debt (work off).

Completion of missed classes is carried out in accordance with the general requirements and rules of the university.

14. Methodical support

• Working program of the discipline;
• Plans for lectures, practical classes and independent work of students;
• Theses of lectures on discipline;
• Methodological developments for the teacher;
• Methodical instructions for practical classes for students;
• Methodical materials providing independent work of students;
• Test and control tasks for practical classes;
• Questions and tasks to control the mastering of the section;
• List of questions to the exam or differentiated credit.

15. Recommended literature

Main (basic)

1. Zalyubovskaya O. I., Zlenko V. V., Avidzba Yu. N., Litvinenko M. I., Changes of Laboratory Indicators under the Influence of Medicines, 2016, – 116 p.
2. Zalyubovskaya O. I., Zlenko V. V., Avidzba Yu. N., Litvinenko M. I., Nechvoglod T. O. Clinical laboratory diagnostics, textbook for students of higher educational institutions, 2016, – 105 p.
3. Zalyubovskaya O. I., Zlenko V. V., Avidzba Yu. N., Litvinenko M. I. Organization of work and provision of sanitary-anti-epidemic regime in laboratory-diagnostic institutions of various profiles, textbook for students of higher educational institutions, 2015, – 105 p.
4.
5. Zalyubovskaya O. I., Litvinova O. N., Kireev I. V., Zlenko V. V., Karabut L. V. Clinical laboratory diagnostics: course of lectures. – Kharkov: Publishing House of the NUPh, 2008. – 175 p.
6. Bazarnova M. A., Vorobyov A. I., Barkagan Z. S. and others. Guidelines for clinical laboratory diagnostics. Vol. 1-2. Textbook / Ed. M. A. Bazarnova, A. I. Vorobyev. – K .: High school, 1991. – 615 p.
7. Danilova L. A. Blood and urine tests. – SPb., 1999. – 128 p.

Supplementary

8. Perederni V. G., Khmelevsky Yu. G., Konopleva L. F. and others. Clinical estimation of biochemical indices at diseases of internal organs. – K .: Zdorovya, 1993. – 192 p.
9. Manual on clinical laboratory diagnostics. Part 1-2 / Ed. M. A. Bazarnova. – Kyiv: Higher school, 1991. – 352 p.
10. Chirkin A. A., Okorkov A. N. Diagnostic guide of the therapist – 2nd ed. – Minsk: Belarus, 1993. – 668 p.
11. 5. Yurkovkszhy O. I., Gritsyuk A. M. General clinical analyzes in the practice of a doctor. – M., 1997. – 123c.

16. Information resources

1. Library of the Kharkiv national medical university.
2. Kharkiv state medical library.
3. Kharkiv state scientific library named after V. G. Korolenko.
4. Specialized medical and biological Internet portals.