



MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution of Higher Education
Far Eastern Federal University
(FEFU)
INSTITUTE OF LIFE SCIENCES AND BIOMEDICINE (SCHOOL)

VALUATION FUND
in the discipline " Clinical and Laboratory Diagnostics"

Vladivostok
2023

List of Forms of Assessment Used at Various Stages of Competence Formation in the Course of Mastering the Discipline "Clinical and Laboratory Diagnostics"

Item No.	Supervised sections/topics of the discipline	Code and name of the indicator of achievement	Learning Outcomes	Evaluation Tools	
				Current control	Intermediate Certification
1.	Topic 1. Introduction to Laboratory Diagnostics	PC-1.1, PP-1.5	Knows	UO-1	UO-1, UO-2, PR-1, PR-2
			Can	UO-2 PR-2	
			Owens	UO-2 PR-2	
2.	Topic 2. Haematological examinations	PC-1.1, PP-1.5	Knows	UO-1	UO-1, UO-2, PR-1, PR-2
			Can	UO-2 PR-2	
			Owens	UO-2 PR-2	
3.	Topic 3. General clinical tests of urine and feces	PC-1.1, PP-1.5	Knows	UO-1	UO-1, UO-2, PR-1, PR-2
			Can	UO-2 PR-2	
			Owens	UO-2 PR-2	
4.	Topic 4. Diagnostics of metabolic pathologies	PC-1.1, PP-1.5	Knows	UO-1	UO-1, UO-2, PR-1, PR-2
			Can	UO-2 PR-2	
			Owens	UO-2 PR-2	
5.	Topic 5. Study of the enzymatic composition of blood	PC-1.1, PP-1.5	Knows	UO-1	UO-1, UO-2, PR-1, PR-2
			Can	UO-2 PR-2	
			Owens	UO-2 PR-2	
6.	Topic 6. Electrolytes and trace elements	PC-1.1, PP-1.5	Knows	UO-1	UO-1, UO-2, PR-1, PR-2
			Can	UO-2 PR-2	
			Owens	UO-2	

				PR-2	
7.	Topic 7 Test				PR-2

*Recommended forms of evaluation tools:

1) interview (MA-1), colloquium (MA-2); Report, Communication (MA-3); Round Table, Discussion, Polemics, Dispute, Debate (SW-4); etc.

2) tests (PR-1); tests (PR-2), essays (PR-3), essays (PR-4), term papers (PR-5), scientific and educational reports on practices (PR-6); laboratory work (PR-7); portfolio (PR-8); project (WP-9); business and/or role-playing game (PR-10); case problem (PR-11); workbook (PR-12), etc.

3) simulator (TS-1), etc.

Scale for assessing the level of achievement of learning outcomes for current and intermediate certification in the discipline "Clinical and Laboratory Diagnostics"

<i>Points (rating score)</i>	<i>Levels of achievement Training</i>		<i>Requirements for the formed competencies</i>
	<i>Current & Intermediate certification</i>	<i>Intermediate Attestation</i>	
<i>100 – 86</i>	<i>Increased</i>	"Passed" / "Excellent"	Freely and confidently finds reliable sources of information, operates with the information provided, has excellent skills in analyzing and synthesizing information, knows all the basic methods of solving problems provided for in the curriculum, knows typical mistakes and possible difficulties in solving a particular problem and is able to choose and effectively apply an adequate method for solving a particular problem. trouble
<i>85 – 76</i>	<i>Base</i>	"Passed" / "Good"	In most cases, he is able to identify reliable sources of information, process, analyze and synthesize the proposed information, choose a method for solving a problem and solve it. Makes single serious mistakes in problem solving, experiences difficulties in rare or difficult cases of problem solving, does not know typical mistakes and possible difficulties in solving this or that trouble
<i>75 – 61</i>	<i>Threshold</i>	"Passed" / "Satisfied"	Makes mistakes in determining the reliability of sources of information, is able to correctly decide only Typical most often Occur trouble in (process information, choose a method to solve a problem, and solve it)
<i>60 – 0</i>	<i>Level Not Reached</i>	"Failed" / "Unsatisfactorily"	Does not know a significant part of the program material, makes significant mistakes, performs practical work unconfidently, with great difficulty.

Current attestation in the discipline "Clinical and Laboratory Diagnostics"

Current certification of students in the discipline "Fundamentals of Clinical and Laboratory Diagnostics" is carried out in accordance with local regulations of FEFU and is mandatory.

Current attestation in the discipline is carried out in the form of an interview to assess the actual learning outcomes of students and is carried out by the leading teacher.

For each object, a description of the assessment procedures is given in relation to the assessment tools used.

Assessment Tools for Ongoing Monitoring

1. Questions for Interview On the topic "General urinalysis":

Topic 3. General clinical examinations of urine and feces.

1. General urinalysis: definition, list of parameters to be examined, their classification.

2. Rules for collecting urine.

3. Analysis of the physical properties of urine: quantity, color, odor, transparency, pH reaction, relative density. Characteristics, reference values, reasons influencing changes.

4. Analysis of chemical properties of urine: protein, glucose, ketone bodies, urobilinogen, bilirubin, hemoglobin. Characteristics, reference values, reasons influencing changes.

5. Sediment microscopy: erythrocytes, leukocytes, epithelium, cylinders, crystals, mucus, bacteria and fungi. Characteristics, reference values, reasons influencing changes.

Requirements for answers:

The answer must be detailed. For each indicator, it is necessary to know the reference values and optimum, the reasons that affect them, and the factors that can falsify the test results.

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7. Case Studies

Analyze the results of a complete blood count:

The patient is 37 years old.

Index	Result	Units	Ref. Values
Hematocrit	37.7	%	35.0-45.0
Hemoglobin	12.9	g/dL	11.7-15.5
Erythrocytes	4.35	mln/ μ L	3.80-5.10
MCV (cf. volume of erythra)	86.6	fL	81.0-100.

RDW (Wide Distribution Erythric)	12.3	%	11.6-14.8
MCH (cf. con. Hb in er.)	30.1	Pg	27.0-34.0
MCHC (cf. end. Hb in er.)	34.8	g/dL	32.0-36.0
Platelets	258	thousands/ μ L	150-400
Neutrophils (total), %	53.1	%	48.0-78.0
Lymphocytes, %	34.1	%	19.0-37.0
Monocytes, %	10.8	%	3.0-11.0
Eosinophils, %	1.2	%	1.0-5.0
Basophils, %	0.8	%	<1.0
Neutrophils, abs.	3.2	thousands/ μ L	1.56-6.13
Lymphocytes, abs.	2	thousands/ μ L	1.18-3.74
Monocytes, abs.	0.6	thousands/ μ L	0.20-0.95
Eosinophils, abs.	0.1	thousands/ μ L	0.00-0.70
Basophila, abs.	0	thousands/ μ L	0.00-0.20
ESR	11	mm/h	< 20

I. Intermediate certification in the discipline "Fundamentals of Clinical and Laboratory Diagnostics"

Intermediate certification of students in the discipline "Fundamentals of Clinical and Laboratory Diagnostics" is carried out in accordance with the local regulations of FEFU and is mandatory.

Evaluation Tools for Intermediate Control (Set-Off)

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Questions for the test.

4th year, 7th semester (autumn)

1. Requirements for the submission of biological material for biochemical analysis.
2. Requirements for the submission of biological material for immunological analysis.
3. Requirements for the delivery of biological material for bacteriological analysis.
4. Factors influencing test results.
5. The concept of norm, reference limits, sensitivity, specificity.
6. Complete blood count – test components, reference values, diagnostic value.

7. Analysis of numerical and qualitative characteristics of erythrocytes, hemoglobin and hematocrit.
8. Erythrocyte sedimentation rate.
9. Leukocyte formula – components to be tested, diagnostic value.
10. Analysis of the blood coagulation system – components to be examined, reference values, diagnostic value.
11. General urinalysis – test components, reference values, diagnostic value.
12. General stool analysis – test components, reference values, diagnostic value.
13. Analysis of carbohydrate metabolism – investigated components, diagnostic value.
14. Analysis of protein metabolism – investigated components, diagnostic value.
15. Analysis of lipid metabolism – components to be examined, diagnostic value.
16. Enzyme diagnostics of liver diseases – studied components, reference values, diagnostic value.
17. Enzyme diagnostics of heart diseases – investigated components, reference values, diagnostic value.
18. Analysis of trace elements – investigated components, diagnostic value.
19. Analysis of essential trace elements – investigated components, reference values, diagnostic value.
20. Analysis of fat-soluble vitamins, diagnostic value.
21. Analysis of water-soluble vitamins, diagnostic value.

Situational tasks for testing the basics of clinical and laboratory diagnostics

Index	Result	Units	Ref. Values
Hematocrit	41.2	%	35.0-45.0
Hemoglobin MR-EPU-844/2-2022	13.9	g/dL	11.7-15.5
Erythrocytes	4.65	mln/ μ L	3.80-5.10
MCV (cf. volume of erythra)	88.6	fl	81.0-100.
RDW (Wide Distribution Erythric)	12.3	%	11.6-14.8
MCH (cf. con. Hb in er.)	29.9	Pg	27.0-34.0
MCHC (cf. end. Hb in er.)	33.7	g/dL	32.0-36.0
Platelets	184	thousands/ μ L	150-400
Leukocytes	7.14	thousands/ μ L	4.50-11.00
Neutrophils (total), %	69.6	%	48.0-78.0
Lymphocytes, %	20.0	%	19.0-37.0

Monocytes, %	8.4	%	3.0-11.0
Eosinophils, %	1.4	%	1.0-5.0
Basophils, %	0.6	%	<1.0
Neutrophils, abs.	4.97	thousands/ μ L	1.56-6.13
Lymphocytes, abs.	1.43	thousands/ μ L	1.18-3.74
Monocytes, abs.	0.60	thousands/ μ L	0.20-0.95
Eosinophils, abs.	0.10	thousands/ μ L	0.00-0.70
Basophila, abs.	0.06	thousands/ μ L	0.00-0.20
ESR	6	mm/h	< 20

Requirements for the submission and evaluation of the test answer:

Answers to all points of the theoretical part of the ticket (questions) must be presented and clearly formulated. In the situational task, indicators that have gone beyond the reference values should be presented and possible reasons for changes should be formed.

Indicative List of Evaluation Tools (AP)

№	Code	Name of the appraisal means	Brief description of the evaluation tool	Presentation valuation in the fund
Oral Questioning				
1	UO-1	Interview	A means of control, organized as a special conversation between the teacher and the student on topics related to the discipline being studied, and Calculated on ascertainment Volume Knowledge a student on a certain section, topic, problem, etc.	Questions on topics/sections of the discipline
2	UO-2	Colloquium	A means of monitoring the assimilation of the educational material of a topic, section or sections of the discipline, organized as a training session in the form of an interview between the teacher and the students	Questions on topics/sections of the discipline
3	UO-3	Report, Communication	The product of the student's independent work, which is a public speech to present the results of the solution of a certain educational, practical, educational research or scientific topic	Topics of reports, messages
4	UO-4	Round table, discussion, polemics, Disputes, debates	Assessment tools that allow students to be involved in the process of discussing a controversial issue, problem and assess their ability to argue their own point of view	List of discussion topics for round tables, discussions, polemics, disputes, debates
Written works				
1	PP-1	Test	A system of standardized tasks that allows you to automate the procedure for measuring the level of knowledge and skills Student	Test Task Fund
2	PP-2	Quiz	A tool for testing the ability to apply the acquired knowledge to solve problems of a certain type on a topic or section	A set of control tasks By variants
3	PR-3	Essay	A tool that allows you to assess the student's ability to express the essence of the problem in writing, independently analyze this problem using concepts and analytical tools of the relevant discipline, to draw conclusions summarizing the author's position on the problem posed	Essay Topics

4	PP-4	Abstract	A product of the student's independent work, representing is a written summary of the results of the theoretical Analysis Certain Scientific (Training-	Abstract Topics
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			research) topic, where the author reveals the essence of the problems, gives different points of view, as well as his own views on it	
5	PP-5	Term paper, term project	The product of the student's independent work, which is a brief summary in writing of the results of the theoretical analysis of a certain scientific (educational and research) topic, where the author reveals the essence of the problem under study, gives various points of view, as well as his own Views on it	Coursework/Project Topics, Term Paper Outlines works/projects, methodological recommendations for writing CR and CP
6	PR-6	Laboratory work	A tool for consolidation and practical mastery of the material for a specific section	A set of tasks for Laboratory Work
7	PP-7	Abstract	A product of the student's independent work, reflecting the The main ideas of the lecture, message, etc.	Sections of the discipline
8	PP-8	Portfolio	A targeted selection of a student's work, revealing his/her individual educational achievements in one or more several academic disciplines	Portfolio Structure
9	PP-9	Project	The final product obtained as a result of the planning and implementation of a set of educational and research tasks. It allows you to assess the ability of students to independently construct their knowledge in the process of solving practical tasks and problems, to navigate in the information space and the level of formation of analytical, research skills, practical and creative thinking skills. Can be executed individually or by a group of students	Topics of group and/or individual projects
10	PP-10	Business and/or role-playing game	Joint activity of a group of students under the guidance of a teacher in order to solve educational and professionally oriented tasks by means of game modeling of a real problem situation. Allows you to assess the ability to analyze and solve typical professional tasks	Theme (problem), concept, roles, and expected outcome for each game
11	PP-11	Case Study	A problem-based task in which the learner is asked to to comprehend the real professionally-oriented situation necessary to solve this problem	Tasks for solving a case problem
12	PP-12	Workbook	Didactic complex designed for independent of the student's work and allows to assess the level of assimilation of the educational material	Sample Workbook

13	PP-13	Multi-level tasks and assignments	<p>A distinction is made between tasks and tasks:</p> <p>a) reproductive level, which makes it possible to assess and diagnose knowledge of factual material (basic concepts, algorithms, facts) and the ability to correctly use special terms and concepts, recognition of objects of study within a certain section of the discipline;</p> <p>b) reconstructive level, allowing to assess and diagnose the ability to synthesize, analyze, generalize factual and theoretical material with the formulation of specific conclusions, the establishment of cause-and-effect relationships;</p> <p>c) creative level, which allows you to assess and diagnose skills, integrate knowledge from various fields, and argue your own point of view</p>	A set of multi-level tasks and tasks
14	PP-14	Cash-Graphic work	A tool for testing the ability to apply the acquired knowledge according to a predetermined methodology to solve problems or tasks on the module or discipline in general	A set of tasks for performing the Graphic Work
15	PR-15	Creative Brief	A partially regulated task that has a non-standard solution and allows you to diagnose skills, integrate knowledge from various fields, and argue your own point View. It can be performed individually or by a group of students	Topics for group and/or individual creative assignments
Technical Means				
1	TC-1	Simulator	A technical tool that can be used to control the professional skills and abilities acquired by the student to manage a specific material object	A set of tasks for working on the simulator