

Academic programme
component

31.05.01 General Medicine
programme

Б1.В.01 Basics of Medical Research
discipline code

ASSESSMENT MATERIALS

Discipline Б1.В.01 Basics of Medical Research

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1. Criteria and assessment of competencies and their mastery indicators, formed by the discipline

Code and competence name	Code and indicator of competence mastery	Results of training in the discipline (module)			Formative assessment	Interim assessment
		<i>To know</i>	<i>To be able to</i>	<i>To have</i>		
УК-1 Can design action plans and apply systematic approach to critical analysis of problem situations	ИД-2УК-1. Collects, systematizes and critically analyzes information necessary to develop a strategy for resolving a problematic situation	<ul style="list-style-type: none"> - standards for the diagnosis and treatment of the most common diseases of the cardiovascular, respiratory, digestive, genitourinary, hematopoietic, musculoskeletal, nervous, immune, and endocrine systems; - the main modern preanalytical and analytical technologies of clinical laboratory research; - principles of operation and rules of operation of the main types of measuring instruments, analyzers and other equipment used in clinical laboratory research; - the technology of organizing and conducting in-laboratory and external quality control of clinical laboratory studies. 	<ul style="list-style-type: none"> - interpret the results of laboratory research in order to conduct a scientific search, formulate a working hypothesis, compare and analyze the results obtained; - to develop algorithms for laboratory diagnostics of patients' condition. 	<ul style="list-style-type: none"> - understanding of a system of theoretical knowledge in the field of clinical laboratory diagnostics; - skills for independent laboratory research. 	<ul style="list-style-type: none"> - a set of tasks for practical work; - test tasks; - report topics 	formative assessment results
ПК-2 Can diagnose a patient	ПК-2.1. Collects complaints, patient's medical history, and their complete physical examination. ПК-2.2. Formulates a preliminary diagnosis and draws up a plan for laboratory and instrumental examinations of the patient, directs them to laboratory and instrumental examinations in accordance with current clinical recommendations (treatment protocols) and standards of medical care ПК-2.3. Taking into account the examination data, carries out a diagnosis of the disease, establishes a diagnosis in					

	<p>accordance with the ICD, if necessary, directs the patient to provide specialized medical care in a hospital.</p> <p>ПК-2.4. Conducts the necessary examinations, analyzes their results, formulates a diagnosis for children-patients.</p>					
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2. Competencies mastery (indicators of their mastery) level assessment

Competencies mastery (their indicators) indices	Criteria and grading system of competencies mastery (indicators of their mastery) assessment			
	Insufficient («unsatisfactory»)	Sufficient («satisfactory»)	Above average («good»)	Advance («excellent»)
Extent of knowledge	Knowledge level is below the required. Major mistakes occurred.	Minimally allowed knowledge level. Minor mistakes occurred.	Knowledge level corresponds well to the educational programme. Minor errors occurred.	Knowledge level corresponds well to the educational programme.
Ability mastery	Basic abilities were not demonstrated during standard tasks completion. Major mistakes occurred.	Basic abilities were demonstrated. All tasks were completed, yet not in full (clarifications are absent, conclusions are incomplete)	All main abilities were demonstrated. All tasks were completed in full, yet with few errors.	All main abilities were demonstrated. All main and additional tasks were completed without mistakes or errors.
Skill mastery (having experience)	Basic skills were not demonstrated during standard tasks completion. Major mistakes occurred	Minimum set of skills for standard tasks completion with minor error, is acquired.	Basic skills were demonstrated in completing standard tasks, yet with few errors.	All main skills were demonstrated in completing main and additional tasks without mistakes or errors.
Competence mastery characteristics	Competencies have not been acquired. The acquired knowledge, skills, and abilities are not enough to solve practical (professional) tasks. OR Insufficient number of credit points as per the established range.	Competencies mastery is adequate. The acquired knowledge, abilities, and skills are mostly sufficient to complete professional tasks.	Competencies mastery mainly satisfies the requirements. The acquired knowledge, abilities, and skills are mainly sufficient to complete professional tasks.	Competencies mastery satisfies the requirements to the full extent. The acquired knowledge, abilities, and skills are fully sufficient to complete difficult professional tasks, including non-standard.

3. Criteria and grading system of the formative assessment tasks

3.1 Criteria and grading system of practical tasks

The list of practical tasks, task completion and presentation recommendations, requirements for results, structure, and contents of practical task report, etc., are presented in methodological guidelines on mastering the discipline as well as in MAU LMS Moodle.

Grade/points	Assessment criteria
<i>Excellent</i>	The task is completed correctly and in full. The laboratory report is well-prepared and satisfies the requirements. Answers to the teacher's questions (during the presentation) are full.
<i>Good</i>	The task is completed in full, yet without sufficient justification or a minor error, which does not impact the argumentation sequence, occurred. All task completion requirements are satisfied.
<i>Satisfactory</i>	The task is completed partially, with mistakes. Adequate level of completed laboratory or practical tasks. Majority of task completion requirements are satisfied.
<i>Unsatisfactory</i>	The task has not been completed.

3.2 Criteria and grading system of tests

The list of test questions and tasks, as well as test procedure description are presented in methodological guidelines on mastering the discipline, as well as in MAU LMS Moodle.

Assessment materials include a typical test variant:

1. The cellular link, vascular endothelium and plasma factors make up the system ...

... **hemostasis**

2. In hemophilia B, there is a deficiency of ... plasma factor.

... **IX** ...

3. In the primary response, immunoglobulins of the class ... are first formed.

... **IgM**

4. An oncomarker is used in the immunodiagnosis of breast cancer ...

... **CA-15-3**

5. With insulinoma, there is a decrease

... **glucose**

6. Reduction of daily diuresis to 500 ml - ...

... **oliguria**

7. Multiple forms of enzymes catalyzing the same reactions, differing in physico-chemical properties, - ...

... **isoenzymes**

8. The greatest activity of ALT is found in ...

... **the liver**

9. The highest activity of creatine phosphokinase is characteristic of ...

... **myocardium**

10. Excess of night diuresis over daytime - ...

... **nicturia**

11. A pathological condition characterized by a decrease in the relative density of urine less than 1005 g/ml - ...

... **hypostenuria**

12. Diabetes insipidus develops with a lack of ...

... **vasopressin**

13. The protein that transports iron in the blood is ...

... **transferrin**

14. Hormone... activates lipogenesis.

... **insulin** ...

15. Megaloblastic anemia develops with a lack of vitamin ...

... **B12**

Grade/points	Assessment criteria
<i>Excellent</i>	90-100% of correct answers
<i>Good</i>	70-89% of correct answers
<i>Satisfactory</i>	50-69% of correct answers
<i>Unsatisfactory</i>	49% or less of correct answers

3.3. Criteria and grading system of the report

The topics of the reports on the discipline (module), the requirements for the structure and contents are set out in the methodological guidelines for the discipline (module), and presented within the electronic course at the MAU LMS Moodle.

Assessment materials include the exemplary topic for the report:

1. The history of the development of clinical laboratory diagnostics.
2. Automated control system (ACS) in CDL.
3. Recommendations on the use of hematology studies in clinical laboratory diagnostics.
4. Recommendations on the use of general clinical studies in clinical laboratory diagnostics.
5. Recommendations on the use of biochemical studies in clinical laboratory diagnostics.
6. Recommendations on the use of immunological studies in clinical laboratory diagnostics.

7. Recommendations on the use of medical genetic research in clinical laboratory diagnostics.
8. The effect of physical activity on the results of laboratory tests.
9. The effect of food on the results of laboratory tests.
10. The influence of biological factors (age, gender, season, circadian rhythms, monthly cycles, etc.) on the results of laboratory studies.
11. Childhood anemia. Laboratory parameters of blood and bone marrow. Clinical and diagnostic significance of the study results.
12. Anemia in elderly people. Laboratory parameters of blood and bone marrow. Clinical and diagnostic significance of the study results.
13. Clinical laboratory diagnostics for emergency conditions in patients with acute and chronic leukemia.
14. Clinical laboratory diagnostics for emergency conditions in patients with hemophilia.
15. Clinical laboratory diagnostics for emergency conditions in patients with thrombocytopenia, thrombocytopathy.
16. Clinical laboratory diagnostics for hepatitis.
17. Clinical laboratory diagnostics for cirrhosis of the liver.
18. Clinical laboratory diagnosis of renal insufficiency.
19. Clinical laboratory diagnostics of emergency conditions in diseases of the pancreas.
20. Clinical laboratory diagnostics of emergency conditions in diseases of the cardiovascular system.
21. Clinical laboratory diagnostics of emergency conditions in kidney diseases.
22. Criteria for quality control of laboratory tests.
23. Indications for prenatal diagnosis.
24. Requirements for laboratory methods of mass neonatal screening programs.

Grade/points	Assessment criteria
<i>Excellent</i>	All the requirements for the report writing and presentation are fulfilled: the problem is identified, and its relevance justified, a brief analysis of various points of view on the problem under consideration is made and one's own position is logically stated, conclusions are formulated, the topic is fully disclosed, the volume is maintained, the requirements for the structure are met, correct answers to additional questions are given.
<i>Good</i>	The basic requirements for the report and its presentation are fulfilled, but there are few errors. In particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the volume of the report is not maintained; there are omissions in the structure; incomplete answers are given to additional questions during the presentation.

<i>Satisfactory</i>	There are significant deviations from the requirements for the report. In particular, the topic is only partially covered; factual errors were made in the content of the report or in answering additional questions; there is no conclusion during the presentation.
<i>Unsatisfactory</i>	The topic of the report is not disclosed, and there is a significant misunderstanding of the problem.

3.4. Criteria and grading system of class attendance

Student attendance is determined in percentage correlation

Points	Assessment criteria
20	attendance 75-100%
17	attendance 50-74%
14	Attendance is less than 50%

4. Criteria and grading system of the discipline (module) results during the interim assessment

Criteria and grading system of the discipline (module) results (credit)

If the student has enough credit points according to the established range of discipline (module), then they passed the discipline.

Grade	Points	Assessment criteria
<i>Pass</i>	60-100	The credit points are scored according to the set range
<i>Fail</i>	less than 60	The credit points have not been scored according to the set range

5. Diagnostic tasks for the assessment of the educational results in the discipline (module) within the framework of internal and external independent assessment of the quality of education

Assessment materials contain tasks for assessing knowledge, skills and abilities that demonstrate the level of competence mastery and indicators of their mastery.

The set of tasks is designed to assess each competence in written form.

The set of tasks includes: *multiple-choice test and test with detailed answer.*

Variant 1

YK-1 Can design action plans and apply systematic approach to critical analysis of problem situations	
	1. In the primary response, immunoglobulins of the class ... are first formed. ... IgM 2. Reduction of daily diuresis to 500 ml - oliguria 3. The greatest activity of ALT is found in the liver

	<p>4. A pathological condition characterized by a decrease in the relative density of urine less than 1005 g/ml - hypostenuria</p> <p>5. A decrease in the normal number of rod-shaped neutrophils and an increase in the number of segmented neutrophils with hypersegmented nuclei is a leukogram shift ... to the right</p> <p>6. With this type of hyperlipoproteidemia, atherosclerosis does not occur I</p> <p>7. Substances, an increase in the concentration of which in biological fluids (blood or urine) is associated with the presence of a malignant tumor and/ or reflects the degree of its spread and the effect of the treatment, cancer markers</p> <p>8. A method by which the excretory ability of the kidneys is evaluated, determining the rate of glomerular filtration and tubular reabsorption by the clearance of endogenous creatinine in blood and urine, - the Rehberg –Tareev test</p> <p>9. Alkalosis is characterized by: A. A decrease in blood pH B. A decrease in the concentration of OH in the blood C. An increase in lactate in the blood D. An increase in blood pH</p> <p>10. An increase in the concentration of which of the listed acute-phase proteins is most pronounced in bacterial inflammation? A. Haptoglobin B. Ceruloplasmin C. CRP D. Transferrin E. Fibrinogen</p>
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III-2 Can diagnose a patient

	<p>1. With insulinoma, there is a decrease glucose</p> <p>2. An oncomarker is used in the immunodiagnosis of breast cancer CA-15-3</p> <p>3. Diabetes insipidus develops with a lack of ... vasopressin</p> <p>4. In hemophilia B, there is a deficiency of ... plasma factor. ... IX ...</p> <p>5. Megaloblastic anemia develops with a lack of vitamin B12</p> <p>6. In chronic lymphocytic leukemia, ... cells are found Botkin – Gumprecht</p> <p>7. A chronic disease in which the bone marrow produces an excessive number of red blood cells - polycythemia</p> <p>8. Compacted, spiraled formations of mucus, often found in the sputum of patients with bronchial asthma or lung tumors, are spirals Kurshman</p> <p>9. Life-threatening is a decrease in the level of total protein in the blood below: A. 40 g/l B. 60 g/l C. 55 g/l D. 50 g/l</p> <p>10. Patient 43 years old, plasma transparent, cholesterol - 5.2 mmol/l, α-cholesterol - 0.94 mmol/l, index atherogenicity - 4,5. The state of lipid metabolism can be regarded as: A. Hyperlipidemia B. Hypocholesterolemia C. Norm D. Spectrum of atherogenic character</p>
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YK-1 Can design action plans and apply systematic approach to critical analysis of problem situations

	<p>1. The highest activity of creatine phosphokinase is characteristic of myocardium</p> <p>2. Excess of night diuresis over daytime - nicturia</p>
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	<p>3. The protein that transports iron in the blood is transferrin</p> <p>4. In the acute phase of bacterial inflammation, the content of ...-lymphocytes in the serum increases most significantly. ... B ...</p> <p>5. The detection of ketones in urine is called ketonuria</p> <p>6. An increase in the number of immature (rod-shaped) neutrophils in peripheral blood, the appearance of metamyelocytes (young), myelocytes - a shift in the leukogram to the left</p> <p>7. Normally, ... epithelium may be detected in the urine, a single one in the field of vision. ... flat ...</p> <p>8. Leukocytes involved primarily in the immediate type hypersensitivity reaction, as well as in delayed type hypersensitivity reactions, inflammatory and allergic processes in the body, basophils</p> <p>9. Absorption of phosphorus in the intestine depends on everything except: A. Blood pH level B. Vitamin D concentration C. Phosphatase activity D. Amylase activity</p> <p>10. The concentration of ionized calcium in the blood increases with: A. Alkalosis B. Acidosis C. Vitamin deficiency D D. Hypoxia</p>
HK-2 Can diagnose a patient	
	<p>1. In hemophilia A, there is a deficiency of ... plasma factor. ... VIII ...</p> <p>2. In primary hypothyroidism, it is elevated... the hormone. ... thyrotropic ...</p> <p>3. For bacterioscopic diagnosis of tuberculosis, microscopy of preparations stained according to ... is used ... Zil-Nielsen</p> <p>4. This type of hyperlipoproteidemia is often observed in atherosclerosis, combined with the development of coronary insufficiency, - III</p> <p>5. In acute leukemia, the replacement of normal cells by ... is detected ... blasts</p> <p>6. The breakdown products of eosinophils, characteristic of bronchial asthma, eosinophilic infiltrates in the lungs, are crystals Charcot – Leiden</p> <p>7. The oncomarker, the most specific for prostate cancer, is prostate-specific antigen</p> <p>8. The greatest diagnostic value in pancreatic lesions is the determination of serum activity α-amylases</p> <p>9. The main factors contributing to the development of atherosclerosis are: A. High serum HDL and low LDL B. High serum LDL and low HDL C. High content of chylomicrons in the blood</p> <p>10. With increased bone resorption, serum activity mainly increases: A. Alkaline phosphatase B. Aminotransferase C. Catalase D. Acid phosphatase E. Lactate dehydrogenase</p>