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FACULTY OF MEDICINE

STUDY PROGRAM 0912.1 MEDICINE

INTERNAL MEDICINE DEPARTMENT

DISCIPLINE OF HEMATOLOGY

APPROVED at the meeting of the Commission for Quality Assurance and Curriculum

Evaluation in Medicine

Minutes No. 1 of 16.09.21

Chairman, PHD, univesity professor

Suman Serghei

APPROVED at the Council meeting of the Faculty Medicine-2

Minutes No. 1 of 21. 09.21

Dean of the Faculty Medicine-2, associate professor Mircea Betiu

APPROVED at the meeting of the Discipline of Hematology Minutes No. 3 of 15.09.2021

Head of the Discipline of Hematology, associate professor Maria Robu Klkoby

SYLLABUS

DISCIPLINE HEMATOLOGY

Integrated studies

Type of course: Compulsory discipline Curriculum was elaborated by an author:

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INTRODUCTION I.

General presentation of the discipline: place and role of the discipline in the formation of the specific competences of the professional / specialty training program

The study of hematology - one of the branches of internal medicine - is of great importance in training doctors of different specialties, because the patients with diseases of the hematopoietic system first consult family doctors, internists, surgeons, dentists, etc. Establishing correct diagnosis and early detection of hematologic pathologies depend on the level of knowledge of doctors of various specialties in this field of medicine, that indicates the major practical importance of the study program in Hematology. The knowledge of methods of providing the emergency assistance will contribute to salvation and survival of patients. The important thing is to acquire the elements of the correct follow-up of patients with the diseases of the hematopoietic system Learning of elements of proper clinical examination of patients with diseases of hematopoietic system is important. The inclusion of Hematology as a compulsory subject in the academic curriculum for medical study programs is an imperative requirement formulated in the congresses and meetings of the curricular linkers of the European Hematology Association (EHA). The Hematology Curriculum was adopted within the medical study programs at the university level.

- Mission of the Curriculum (aim) in professional training: The study of etiology, pathogenesis, clinical manifestations, methods of laboratory and instrumental examination of patient in order to diagnose the diseases of the hematopoietic system, learning the general principles of treatment and prophylaxis of these diseases.
- Language (s) of discipline teaching: Romanian, English, French.
- Beneficiaries: students of the IV-th year, faculties of Medicine-1 and Medicine-2.

. MANAGEMENT OF THE DISCIPLINE				
Code of discipline		S.07.O.064		
Name of the discipline	;	Hematology		
Person in charge of the discipline Head of the Discipline - Maria Robu, M associate professor		Robu, MD, PhD,		
Year	IV	Semester VII		
Total number of hours, including:			120	
Lectures	20	Practical/Laboratory hours	20	
Seminars	20	Self-training	60	
Form of assessment	Ε	Number of credits	4	

Π

III. TRAINING AIMS WITHIN THE DISCIPLINE

Development of knowledge about the morphology and physiology of the hematopoietic system; Development of knowledge about the epidemiology, etiology and pathogenesis of benign haematological diseases (anemia due to erythrocyte formation disorders, anemia due to accelerated destruction of erythrocytes, posthemorrhagic anemia, thrombocytopenia, coagulopathy) and malignant (acute myucemia, lymphocytic leukemia, chronic leukemia, leukemia polycythemia vera, essential thrombocythemia, chronic monocytic leukemia, multiple myeloma, Waldenstrom's macroglobulinemia, Hodgkin lymphoma, non-Hodgkin lymphomas);

Development of knowledge about the clinical-hematological and morphological features of benign and malignant pathologies of the hematopoietic system;



Acquiring practical skills in establishing the diagnosis and providing medical assistance to patients with benign and malignant hematological diseases;

Development of skills for the follow-up and usage of methods of investgation, treatment and prophylaxis in benign and malignant pathologies of the hematopoietic system;

Development of professional capacities focused on providing the emergency medical care in benign and malignant hematological diseases;

Promoting the principles of ethics and deontology in the medical care of patients with benign and malignant pathologies of the hematopoietic system;

Orientation of learning towards family medicine, with the highlighting of the most frequent pathologies in hematological practice.

At the end of the discipline study the student will be able to know:

at the level of knowledge and understanding:

• To define the theoretical bases of haematology in norm and pathology;

• To know the etiology, pathogenesis, epidemiology of the benign and malignant pathologies of the haematopoietic system;

• To identify the features of clinical and laboratory examination of the patient with the benign and malignant pathologies of the haematopoietic system;

• To detect the symptoms and clinical syndromes of the benign and malignant hemopathies;

- To define diagnostic criteria and to identify nosological hematological entities;
- To know the principles of treatment and prophylaxis of the benign and malignant hemopathies.

at the application level:

• History-taking of the haematological patient and interpretation of the data of physical examination;

- To possess the palpation of peripheral lymph nodes, spleen and liver;
- To know the normal values of complete blood count and myelogram;
- To interpret the complete blood count and bone marrow aspirate data in different types of malignant hematological diseases;
- To use the algorithm of diagnosis of anemias;
- To make up the differential diagnosis of anemias;
- To use the algorithm of identification of the main groups of malignant hematological diseases;
- To apply the principles of treatment and prophylaxis of hematological malignancies;
- To conduct the differential diagnosis of lymphadenopathies and splenomegaly;
- To use the algorithm of identification of the main groups of bleeding disorders;
- To assert the plan of laboratory examinations of patients with hemorrhagic hemopathies;
- To interpret the coagulation tests in different coagulation disorders;
- To provide emergency assistance in tumor lysis syndrome, febrile neutropenia and septic shock;
- To provide emergency assistance in spinal cord compression (paraparesis) and mediastinal compression syndromes;
- To provide emergency assistance in hemolytic crises and hemorrhages as a result of primary and secondary hemostasis disorders.

at the integration level:

• To estimate the importance of haematology in the context of General Medicine and its integration with the related medical disciplines;

• To plan and decide the objectives of diagnostic and medical care together with hematological patient and legal representatives;

• To be able to correctly analyze the legal framework in the field of Medicine, Oncohematology and to apply the provisions of normative acts in clinical practice;

• To know the reactions of the haematopoietic system in various pathologies of internal organs;



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- To perform the differential diagnosis of haematological malignancies and leukemoid reactions;
- To assess the acute hemostatic disorders in surgical and obstetric practice;
- To perform the optimal decision-making in providing emergency assistance in the critical clinical situations;

• To formulate the principles of ethics and deontology in health care for patients with leukemias and malignant lymphomas.

IV. PROVISIONAL TERMS AND CONDITIONS

Programs: histology, cytology, physiology, pathophysiology, pathology, biochemistry, immunology, internal medicine, oncology, epidemiology, medical statistics.

Competences : basic digital skills (internet use, document processing, use of text editors, electronic whiteboards and presentation applications), abilities of clinical thinking, interpretation, communication and teamwork skills.

V. THEMES AND ESTIMATE ALLOCATION OF HOURS Lectures, practical hours/ laboratory hours/seminars and self-training

	THEME		Number of hours		
No. d/o			Practical workshops/ Seminars	Self- training	
1.	Morphology and physiology of the hematopoietic system. Anemias. Classification of anemias. Iron deficiency anemias.	2	4	6	
2.	Megaloblastic anemias. Vitamin B12 deficiency anemia. Folic acid deficiency anemia.	2	4	6	
3.	Aplastic anemias. Metaplastic anemias. Renal anemias. Anemias of chronic disorders.	2	4	6	
4.	Hereditary and acquired hemolytic anemias.	2	4	6	
5.	Hematologic malignancies. Classification and their correlation with the scheme of hematopoiesis. Epidemiology. Etiology. Pathogenesis. Acute leukemias. Neutropenia.	2	4	6	
6.	Chronic myeloid leukemia. Primary myelofibrosis. Chronic monocytic leukemia. Essential thrombocytemia. Polycythemia vera.	2	4	6	
7.	Chronic lymphocytic leukemia. Hairy-cell leukemia. Paraproteinemic hematological malignancies: Multiple myeloma. Waldenström macroglobulinemia.	2	4	6	
8.	Malignant lymphomas: Hodgkin lymphoma. Non-Hodgkin lymphomas.	2	4	6	
9.	Normal hemostasis. Classification of bleeding disorders. Disorders of thrombocyto-vascular hemostasis: Immune thrombocytopenias. Hereditary hemorrhagic telangioectasia.	2	4	6	
10.	Coagulation disorders: Haemophilia. Von Willebrand's disease.	2	4	6	
	ΤΟΤΑΙ	20	40	60	
			120		
	TOTAL	20		40 120	



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VI. PRACTICAL TOOLS PURCHASED AT THE END OF THE COURSE

Mandatory essential practical tools are:

• To record and establish effective relationships with patients and relatives in future professional practice;

• To plan and decide on the objectives of diagnostic and medical care together with the patient and their relatives;

• To develop communication skills of bad diagnosis and other bad news;

• To be able to correctly analyze the legal framework in the field of Medicine, Oncohematology and to apply the provisions of normative acts in clinical practice;

• To be able to draw up the examination plan for the patient with the primary involvement of the mediastinal lymph nodes, the abdominal cavity and the retroperitoneal space;

• To be able to draw up the examination plan for patients with the spleen involvement for the differential diagnosis between splenomegaly and tumor sites in the left hypochondrium;

• To perform the clinical determination of the type of hemorrhagic syndrome;

• To interpret the results of the examination of the blood picture in different benign and malignant pathologies of the hematopoietic system, leukemoid reactions;

- To determine the bleeding time after Duke;
- To determine the coagulation time after Lee-White;
- To interpret the coagulation tests data in hemostasis pathologies;
- To develop a treatment plan for different types of anemia;
- To develop the treatment plan for different types of acute and chronic leukemias;
- To develop a treatment plan for different types of malignant lymphomas;
- To develop the treatment plan for different types of hemorrhagic hemopathies;
- To apply various methods of patient mobilization;

• To make a prompt diagnosis of emergencies in benign and malignant hematological diseases;

• To develop algorithms for the treatment of emergencies in benign and malignant hematological diseases;

• To be able to diagnose the terminal condition of malignant hematological diseases and to manage the situation correctly;

- To apply the principles of transfusion treatment with blood components;
- To know how to respect the rights of the patient and their relatives.

VII. OBJECTIVES AND CONTENT UNITS

Objective	Content units	
Theme 1. Hematology. The field of research and fundamental concepts		
• To define the fundamental concepts of haematology;	The fundamental concepts of haematology.	
• To know the particularities of the examination of the patient	The definition of anemia. Classification of anemias.	
with various types of anemia;	Anemia due to disorder of formation of erythrocytes	
• To use the algorithm of diagnosis of anemias;	(iron-deficiency anemia, megaloblastic anemias,	
· To know the methods of instrumental and laboratory	aplastic anemia, metaplastic anemia, renal anemia,	
research of patients with anemia;	anemias of chronic disoorders).	
• To demonstrate skills of analysis and systematization of the	Anemia due to the accelerated destruction of	
knowledge of the different forms of anemia;	erythrocytes (hereditary and acquired hemoytic	
 To perform the differential diagnosis of anemias; 	anemias).	



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Objective	Content units
• To apply knowledge from other disciplines;	Posthaemorrhagic anaemia.
• To formulate conclusions.	
Theme 2. Hematologic malignancies	
 To define the fundamental concepts of haematological malignancies; To know the particularities of examination of patients with acute leukaemias and chronic; To know the methods of laboratory and instrumental examination of patients with acute and chronic leukaemias; To demonstrate skills of analysis and systematization of knowledge of various types of leukemias; To formulate conclusions 	The fundamental concepts of haematological malignancies. Classification of haematological malignancies. Acute leukaemias. Chronic myeloid leukemia. Primary myelofibrosis. Chronic monocytic leukaemia. Essential thrombocytemia. Polycythemia vera. Chronic lymphocytic leukemia. Hairy-cell leukaemia. Paraproteinemic haematological malignancies: Multiple myeloma. Waldenström macroglobulinemia.
• To define the fundamental concepts of malignant	The fundamental concepts of malignant lymphomas
lymphomas;To know the particularities of the examination of the patient with malignant lymphoma;To know the methods of laboratory and instrumental	Hodgkin lymphoma. Clinical and histopathological classification. Clinical picture. Diagnosis and differential diagnosis. Principles of treatment.
investigation of patients with malignant lymphomas;To demonstrate the skills of analysis and systematization of knowledge of different types of malignant lymphomas;	Non-Hodgkin lymphomas. Histopathological classification. Clinical picture. Diagnosis and differential diagnosis.
• To formulate conclusions.	Principles of treatment.
 Ineme 4. Hemorrhagic nemopathies (Bleeding disorders) To define the fundamental concepts of hemorrhagic hemopathies; To know the particularities of the examination of the patient with haemorrhagic hemopathies; To know the methods of laboratory and instrumental research of patients with hemorrhagic hemopathies; To demonstrate the skills of analysis and systematization of knowledge of various types of haemorrhagic diatheses; To formulate conclusions. 	The fundamental concepts of the hemorrhagic hemopathies. Classification of bleeding disorders. Clinical types of bleeding. Disorders of thrombocyto-vascular hemostasis: Immune thrombocytopenias. Rendu-Osler disease. Coagulation disorders: Haemophilia. Von Willebrand disease.

VIII. PROFESSIONAL (SPECIFIC (SC)) AND TRANSVERSAL (TC) COMPETENCES AND STUDY FINALITIES

✓ Professional (specific) competences (PC)

- PC 1. Responsible execution of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force;
- PC 2. Adequate knowledge of the sciences about the structure of the body, physiological functions and behavior of the human body in various physiological and pathological conditions, as well as the relationships between health, physical and social environment;
- PC 3. Resolving clinical situations by developing a plan for diagnosis, treatment and rehabilitation in various pathological situations and selecting appropriate therapeutic procedures for them, including providing emergency medical care;
- PC 4. Promoting a healthy lifestyle, applying prevention and self-care measures;



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- PC 5. Interdisciplinary integration of the doctor's activity in a team with efficient use of all resources;
- PC 6. Carrying out scientific research in the field of health and other branches of science.
- ✓ Transversal competences (TC)
 - TC1. Autonomy and responsibility in the activity;
 - TC2. Effective communication and digital skills.
- ✓ Study finalities

At the end of the course the student will be able to:

- 1. To record and establish effective relationships with patients and relatives in future professional practice;
- 2. To plan and decide on the objectives of diagnostic and medical care together with the patient and their relatives;
- 3. To develop communication skills of bad diagnosis and other bad news;
- 4. To be able to correctly analyze the legal framework in the field of Medicine, Oncohematology and to apply the provisions of normative acts in clinical practice;
- 5. To define the theoretical bases of haematology in norm and pathology;
- 6. To know the etiology, pathogenesis, epidemiology of the benign and malignant pathologies of the haematopoietic system;
- 7. To identify the features of clinical and paraclinical examination of the patients with the benign and malignant pathologies of the haematopoietic system;
- 8. To detect the symptoms and clinical syndromes of the diseases of the hematopoietic system;
- 9. To define diagnostic criteria and to identify hematological nosological units;
- 10. History-taking of the hematological patient and interpretation of the data of physical examination;
- 11. To use the methods of the diagnosis of anemias;
- 12. To establish the diagnosis and to provide medical assistance to patients with various types of anemia;
- 13. To interpret the data of complete blood counts and myelogram in various types of hematological malignancies;
- 14. To know the principles of treatment and prophylaxis of the diseases of the hematopoietic system;
- 15. To use the algorithm of identification of the major groups of bleeding disorders;
- 16. To assert the plan of laboratory examinations of patients with hemorrhagic hemopathies;
- 17. To interpret the coagulation tests in different coagulation disorders;
- 18. To provide emergency assistance in hemolytic crises, spinal cord and mediastinal compression, and in hemorrhages as a result of primary and secondary hemostasis disorders.
- **Note. Discipline finatities** are deduced from the professional competencies and formative valences of the informational content of the discipline.



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IX.	STUDENT'S SELF-TRAINING			
No.	Expected product	Implementation strategies	Assessment criteria	Implementation terms
1.	Work with information sources	Careful reading of lecture or the textbook material on the theme. Reading the questions on the theme, that requires a reflection on the subject. Refer to the list of additional information sources on the theme. Choose the source of additional information on the topic. Reading of the text entirely, carefully and writing down the essential content. Making generalizations and conclusions related to the importance of the theme/subject.	The ability to extract the essentials; skills to interpret; the volume of work	During the module
2.	Working with the practical lesson book	To analyze the information and the images on the topic based on the material from the lectures and textbook, taking into account the tasks in the notebook. Consistent solving the tasks. Drawing conclusions at the end of each lesson. The verification of the aims of the corresponding lesson and assessment of their achievement. Searching for the additional information, using e-mail addresses and supplementary bibliography.	The volume of work, solving situational problems, the ability to draw conclusions	During the module
3.	Application of various learning techniques	Practice testing: performing practical tests; Distributed practice: spreading learned knowledge; Interspersed practice: combining different problems and materials in a single study session; Elaborated query: generating an explanation for which a fact or concept is true; Self-explanation: explaining how new information is related to the known explanation or explaining the steps taken during problem solving; Rereading: studying the text material again after an initial reading; Highlighting and underlining: visual highlighting of important parts of the text that need to be	The volume of work, the degree of penetration into the essence of various topics, the level of scientific argumentation, quality of conclusions, elements of creativity, demonstration of the problem understanding, formation of personal attitude	During the module



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		learned while reading; Summary: writing a summary of what you have learned; Mental images of text: trying to form mental images of text while reading or listening.			
4.	Working with online materials	Online self-assessment, online study of materials on the website of the department, expressing one's own opinions through the forum and chat	The number and duration of entries on the site, the results of self-assessment	During tl module	he
5.	Presentation preparation and holding	Choice of the topic for research, makig the research plan, provision of the terms of realization. Setting the project components / PowerPoint presentation – topic, objective, results, conclusions, practical applications, bibliography. Reviews by colleagues. Reviews by professors and lecturers	Volume of work, the degree of penetration into the essence of the topic of the project, the level of scientific argumentation, the quality of conclusions, elements of creativity, personal attitude formation, coherence of exposure and scientific correctness, graphic presentation, presentation method.	During tl module	he

X. METHODOLOGICAL SUGGESTIONS FOR TEACHING-LEARNING-ASSESSMENT Teaching and learning methods used

Different methods and didactic processes are applied in teaching Hematology. They oriented towards the efficient acquisition of knowledge and achievement of the objectives of the didactic process. In theoretical classess, along with traditional methods (lesson-exposure, lesson-conversation, synthesis lesson), modern methods (lesson-debate, lesson-conference) are also used. Practical forms of individual, frontal, group work. In order to acquire deep knowledge of material, different semiotic systems (scientific language, graphical and computerized language) and didactic materials (tables, diagrams, photophotographs, transparencies) are used. In classes and extracurricular activities Information Communication Technologies - Power Point presentations are used.

• Applied teaching strategies / technologies (specific to the discipline)

• **Observation** – Identification of characteristic elements of structures or haematological phenomena, description of these elements or phenomena.

• Analysis – Imaginary decomposition of the whole into component parts. Highlighting the essential elements. Studying each element as a part of the whole.

• Schema / figure analysis – Choice of the required information. Recognition based on the knowledge and information of structures indicated in the drawing. Analysis of the functions / role of recognized structures.

• **Comparison** - Analysis of the first object / process in a group and determination of its essential features. Analysis of the second object / process and the determination of its essential features.

• **Comparing objects / processes and highlighting** common features. Comparing objects / processes and determining differences. Establishing the criteria for decommissioning. Drawing conclusions.Methods of assessment(including the method of final mark calculation)

• Classification – Identification of the structures / processes to be classified. Determining the criteria on which classification is to be made. Distribution of structures / processes by groups



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according to established criteria.

• Scheme drawing – Selection of elements, which must be included in the scheme. Playback of the Elements Selected by Different Symbols / Colors and indicating their relationships. Wording of an appropriate title and legend of the symbols used.

• Modeling - Identify and select the elements needed for modeling

phenomenon. The imaging (graphical, schematic) of the phenomenon studied.

Presentation of the phenomenon using the developed model. Drawing conclusions, deduced from arguments or findings.

Other applied teaching strategies / technologies (specific to the discipline):

"Multi-voting"; " Round table"; "Group Interview"; "Case Study"; "Creative Controversy".

Methods of assessment (including the method of final mark calculation):

Current: totalisation or individual / personal checkup by:

- (a) Applying of the docimological test
- (b) Settlement (resolution) of problems / exercises
- (c) Analysis of the clinial case studies
- (d) Creative controversy of the discussed subjects
- (e) Checking workshops

Final: exam (practical tools, computer-based test, oral exam)

Students with the average annual mark below 5.0, as well as students who have not recovered absences from the practical classes are not admitted to the exam in Hematology.

The exam in Hematology is a combined test, consisting of practical skills, computer-based test and oral test.

The computer-based test consists of 1000 questions on the course of Hematology, of which 40% are single-choice tests, and 60% - multiple-choice tests. The student has 2 hours to do the test. The test is graded from 0 to 10.

The practical tools are performed with the participation of patients . Each student manages a patient with hematopoietic pathology within 20-30 minutes. Later, he reports to the examiner, the patient's anamnesis, objective data, makes a preliminary diagnosis, draws the plan of investigations and treatment. The test is graded with notes from 0 to 10.

The exam subjects are approved at the discipline meeting and are communicated to the students at least one month before the session.

The final mark consists of 4 components: annual average mark (coefficient 0.3), practical skills (coefficient 0.2), computer-based test (coefficient 0.2) and oral exam (coefficient 0.3).

The knowledge is assessed with marks from 1 to 10 with two decimal places, as follows:

The scale of assessment

The students' knowledge is assessed with marks from 1 to 10 with 2 decimal places. Grades from "5" to "10", obtained in the result of the evaluation of the course unit, allow the obtaining of credits provided for them according to the curriculum. The final mark results from the sum of marks of current assessments and the final examination, being rounded up to whole number for the benefit of the student. The student who gets a mark less than "5" at the current assessment is not admitted to the final assessment.



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Intermediate marks scale (annual average, marks from the examination stages)	National Assessment System	ECTS Equivalent
1,00-3,00	2	F
3,01-4,99	4	FX
5,00	5	
5,01-5,50	5,5	Ε
5,51-6,0	6	
6,01-6,50	6,5	D
6,51-7,00	7	D
7,01-7,50	7,5	C
7,51-8,00	8	C
8,01-8,50	8,5	р
8,51-9,00	9	Б
9,01-9,50	9,5	•
9,51-10,0	10	A

Method of mark rounding at different assessment stages

The average annual mark and the marks of all stages of final examination (computer assisted, test, oral) - are expressed in numbers according to the mark scale (according to the table), and the final mark obtained is expressed in number with two decimals, which is transferred to student's record-book.

Absence on examination without good reason is recorded as "absent" and is equivalent to 0 (zero). The student has the right to have two re-examinations in the failed exam.

XI. RECOMMENDED LITERATURE:

A. Compulsory:

- 1. Adam Cuker, Jessica K. Altman, Aaron T. Gerds et al. American Society of Hematology Self-Assessment Program. Blackwell Publishing, 7th Edition, 2019: 451 p. www.ash-sap.org
- 2. Hoffbrand A.V., Higgs D.R., Keeling D.M., Mehta A.B. Postgraduate Haematology, 7th Edition. Wiley Blackwell, 2016: 934 p.
- 3. Kaushansky K., Lichtman M., Beutler E. et al. Williams Hematology, 8th Edition. The McGraw-Hill Companies, Inc., 2010.
- 4. Musteata Vasile, Corcimaru Ion. Course of Lectures on Hematology and Military Therapy. Chisinau, 2004: 177 p.
- 5. Pillot Giancarlo, Chantler Marcia, Magiera Holly et al. The Washington Manual. Hematology and Oncology Subspecialty Consult. Lippincott, Williams & Wilkins, 2004: 279 p.
- 6. Williams M.E., Kahn M.J. American Society of Hematology Self-Assessment Program. Blackwell Publishing, 2005: 451 p.

B. Additional

- 1. Bain Barbara J. Picture Tests in Hematology. Colour Guide. Churchill Livingstone, 1998: 116 p.
- 2. Hoffbrand A.V., Pettit J.E., Moss P.A. et al. Essential Hematology. Blackwell Science Ink.: 4th edition, 2001: 349 p.



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- 3. Larry Hematology, for the House Officer Waterbury. Hematology (House Officer series) by Lippincot, Williams & Wilkins: 4th edition, 1996: 179 p.
- 4. Mehta Atul B., Hoffbrand A. Victor. Hematology at a Glance. Blackwell Science /ink.: 1st edition, 2000: 122 p.
- 5. Wood Marie E. and Brunn Paul A. Jn. Hematology and Oncology Secrets. 2nd Edition. Hanley & Belfus, 1999: 400 p.

Head of the Discipline of hematology, associate professor

Studies chief of the Discipline of hematology, associate professor

Maria Robu

Vasile Musteata