

1. COURSE DESCRIPTION – GENERAL INFORMATION			
1.1. Course teacher	Professor Mirna Sučić, PhD	1.6. Year of study	3 rd
1.2. Name of the course	Hematology II	1.7. Credit value (ECTS)	5
1.3. Associate teachers	Professor Renata Zadro, PhD	1.8. Type of instruction (number of hours L+E+S+e-learning)	25+20+15
1.4. Study programme (undergraduate, graduate, integrated)	Integrated study of Medical biochemistry	1.9. Expected enrolment in the course	25
1.5. Status of the course	Compulsory	1.10. Level of use of e-learning (1, 2, 3 level), percentage of instruction in the course on line (20% maximum)	2 nd
2. COURSE DESCRIPTION			
2.1. Course objectives	The aim of the course is to learn pathophysiology and classifications of benign and malignant disorders of leukocytes, erythrocytes and thrombocytes, to describe diagnostic indicators of these disorders and to learn about connection of laboratory indicators with pathophysiology and clinics of benign and malignant disorders of leukocytes, erythrocytes and thrombocytes.		
2.2. Enrolment requirements and required entry competences for the course	Hematology I and Pathophysiology with pathology courses		
2.3. Learning outcomes at the level of the study programme to which the course contributes	<ul style="list-style-type: none"> Applying fundamental knowledge about hematopoiesis, hematopoietic cytomorphology and their role in physiology and pathophysiology of hematopoietic system in defining, analyzing and proposal of laboratory tests for detecting and follow-up of diseases and treatment monitoring. Evaluating the clinical relevance of biochemical and molecular biology indicators (detecting certain indicators of whole blood count and other hematological laboratory indicators specific for certain benign and malignant disorders of leukocytes, erythrocytes and thrombocytes) in interpreting laboratory analysis results from an analytical and clinical point of view. 		
2.4. Expected learning outcomes at the level of the course (4-10 learning outcomes)	<p>At the end of the course the trainee will be able to:</p> <ol style="list-style-type: none"> Define basic pathophysiological causes of disorders of leukocytes, erythrocytes and thrombocytes. Define classifications of disorders of leukocytes, erythrocytes and thrombocytes. Apply expert knowledge of connection of pathophysiology with clinical and laboratory indicators of disorders of 		

	<p>leukocytes, erythrocytes and thrombocytes.</p> <p>4. Define and interpret specific hematological and other laboratory results of certain leukocyte, erythrocyte and thrombocyte disorders from an analytical and clinical point of view</p>
<p>2.5. Course content broken down in detail by weekly class schedule (syllabus)</p>	<p>LECTURES:</p> <ul style="list-style-type: none"> • Pathophysiological classification of anemias. Hemolytic anemias. • Pathophysiological and erythrocyte indices classifications of anemias. Megaloblastic and iron deficiency anemia. • Disorders of hematopoietic stem cell. Hypoproliferative anemia. Aplastic anemia. PNH. • Disorders of granulocytes. • Disorders of monocytes. • Thrombocytopenias. Thrombocytosis. Thrombopathias. • Immunodeficiency. AIDS. • Classification of malignant lymphoproliferative disorders. Malignant lymphomas. • Chronic lymphocytic leukemia. Amyloidosis. Multipole myeloma. • Classification of tumors of myeloid cells. Chronic myeloproliferative disorders. • Classification of tumors of myeloid cells. Myelodysplasia (MDS). • Acute leukemia. Bone marrow transplantation. <p>SEMINARS:</p> <ul style="list-style-type: none"> • Anemias I- cytomorphology and laboratory indicators. <i>Diagnostic approach to patient with anemia.</i> • Anemias II- cytomorphology and laboratory indicators. <i>Diagnostics of hemolytic anemias.</i> • Cytomorphology of leukocytosis. <i>Guidelines for hematological diagnostics of leukocytosis.</i> • Disorders of lymphocytes. <i>HIV.</i> • Cytomorphology and immunology of lymphoid cell tumors. <i>Flow cytometry.</i> • Cytomorphology of malignant lymphoproliferative disorders. <i>Cytogenetics and molecular biology of malignant lymphoproliferative disorders.</i> • Cytomorphology and laboratory indicators of chronic myeloproliferative disorders. <i>Philadelphia chromosome. Jak2 mutation.</i> • Cytomorphology and laboratory indicators of myelodysplasia. <i>5q deletion. Cytogenetics of MDS.</i> • Cytochemistry and immunodiagnostics of acute leukemias. <i>Cytogenetics and molecular biology of acute leukemias.</i> <p>EXERCISES:</p> <ul style="list-style-type: none"> • Megaloblastic anemia in bone marrow. Cytomorphology of megaloblastic and normal bone marrow. • Cytomorphology and erythrocyte indices of iron deficiency anemia and megaloblastic anemia. • Hemolytic anemias: cytomorphology and erythrocyte indices. • Cytomorphology of granulocyte disorders. • Cytomorphology of infective mononucleosis and multiple myeloma. • Cytomorphology of chronic lymphocytic leukemia and chronic myeloid leukemia. • Cytomorphology of acute myeloid leukemia and acute lymphoid leukemia. Myelodysplasia. • Cytochemistry- technique and analysis of acid and alkaline phosphatase. Score of granulocyte alkaline

	phosphatase. • Cytochemistry- technique and analysis of myeloperoxidase. Immunocytochemistry. • Repetition of all exercises and preparation for practical exam.					
2.6. Type of instruction	<u>lectures</u> <u>seminars and workshops</u> <u>exercises</u> online in entirety mixed e-learning field work		independent study multimedia and the internet <u>laboratory</u> work with the mentor (other)		2.7. Comments: Fonts in <i>italic</i> indicate students seminars.	
	2.8. Student responsibilities					
2.9. Screening of student's work (specify the proportion of ECTS credits for each activity so that the total number of CTS credits is equal to the credit value of the course)	Class attendance	1.5	Research		Practical training	
	Experimental work		Report			
	Essay		Seminar essay	1	(Other--describe)	
	Tests	1	Oral exam		(Other—describe)	
	Written exam	1.5	Project		(Other—describe)	
2.10. Grading and evaluation of student work over the course of instruction and at a final exam	Final exam; (written test), practical test of exercises classes, credits for regularly attendance of classes, credits for active participation in seminars.					
2.11. Required literature (available at the library and via other media)	Title					
	Labar B, Hauptmann E and coworkers. Hematology. Zagreb: Školska knjiga, 2007.					
	Labar B, Hauptmann E. And coworkers. Hematology. Zagreb: Školska knjiga 1998.					
2.12. Optional literature	Radić Antolic M, Sučić M; Zadro R. Skripta- Clinical biochemistry with hematology (Hematology), University of Zagreb Faculty of Pharmacy and Biochemistry, 2005. (<i>1 copy at the library</i>) McKenzie SB. Clinical Laboratory Hematology (2nd edition). Prentice Hall 2010.					
2.13. Methods of monitoring quality that ensure acquisition of exit competences	Learning outcomes 1-2 are tested by written exam, learning outcomes 3 and 4 are tested during laboratory practice and seminars.					