COURSE UNIT DESCRIPTION FOR MEDICAL STUDENTS IN LABORATORY MEDICINE

Course unit (module) title	Code
Laboratory medicine	

Lecturer(s)	Department(s) where the course unit (module) is d ered
Coordinator: Assoc. Prof. Dovilė Karčiauskaitė **Other(s):** Assoc. Prof. Rėda Matuzevičienė, Assoc. Prof. Loreta Bagdonaitė, Assoc. Prof. Silvija Kiverytė, Asst. Prof. Valdas Banys, Dr. Vytautas Žėkas, Aleksandr Lapšinov.	Vilnius University, Faculty of Medicine, Institute of Biomedical Sciences, Department of Physiology, Biochemistry, Microbiolog Laboratory Medicine, M.K. Čiurlionio str. 21, LT-03101, Vilnius

Study cycle	Type of the course unit (module)
Integrated studies (Ist and IInd stage)	Compulsory

Mode of delivery	Period when the course unit (mod- ule) is delivered	Language(s) of instruction
Lectures and seminars in auditorium	VII-th semester	Lithuanian and English

Requirements for students	
Prerequisites: A student must have completed the following courses: Human anatomy (ZMAN2115, ZMAN2215, ZMAN2315), Human histology (ZMHI2115, ZMHI2215, ZMHI2315), General and human biology (BZBI1112), General and human genetics (BZGE2112), General and bioorganic chemistry (CHEM1112), Human physiology (ZFIZ2115, ZFIZ2215), Biochemistry (BIOC2115, BIOC2215), Microbiology (MMIK2115, MMIK2215), Pathology (PATO2115, PATO2215), Pharmacology (FARM2115, FARM2215), Fundamentals of clinical oncology and cancer biology (KONK3115).	**Additional requirements (if any):** None

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5	135	68	67

Purpose of the course unit (module): programme competences to be developed		
The purpose is to develop an understanding of basic laboratory tests in the diagnosis of various diseases, influence of variabl the performance. To train to evaluate and interpret basic laboratory tests.		
Learning outcomes of the course unit (module)	**Teaching and learning methods**	**Assessment methods**
Generic competences		
Professional Ethics and Communication skills development: To act fairly and according to ethical obligations, apply good medical practice principles at work, be emphatic, to think critically and self-critically, be creative, take the initiative, goal-driven, to communicate with other professionals in timely manner.	Lectures and seminars in auditorium; Exercises and tutorials in auditoriums and laboratories.	Tests, topics and tasks of open/closed type. Presentati scientific article.
Critical assessment of own competencies: To make an assessment within the limits of own competence and, if necessary, ask for help, to act in new situations and adapt to them, to act independently, to solve problems, to make decisions, to work with specialists of other fields, be able of planning and organising activities.	Lectures and seminars in auditorium; Exercises and tutorials in auditoriums and laboratories.	Tests, topics and tasks of open/closed type. Presentati Clinical rounds.
Subject-specific competences		
Assessment of clinical signs, ordering tests, differential diagnostics and preparation of the monitoring plan: To recognise and assess the severity of clinical signs, order required tests and interpret their results, carry out differential diagnostics, prepare the relevant patient monitoring plan.	Lectures and seminars in auditorium; Exercises and tutorials in auditoriums and laboratories; Problem oriented learning.	Tests, topics and tasks of open/closed type.
Efficient communication in medical practice: To communicate with patients, colleagues, relatives of patients, disabled people.	Lectures and seminars in auditorium; Exercises and tutorials in auditoriums and laboratories.	Tests, topics and tasks of open/closed type. Presentati Clinical rounds.
Application of evidence-based medical principles, skills and knowledge: To use scientifically-based evidence in practice, to search for the relevant literature, critically assess published medical literature.	Lectures and seminars in auditorium; Exercises and tutorials in auditoriums and laboratories; Problem oriented learning.	Presentation, scientific artic

Efficient use of information and information technologies in medical practice: To properly and completely produce and store medical documentation, use computers, search for sources of literature, store and update information.	Lectures and seminars in auditorium; Exercises and tutorials in auditoriums and laboratories; Problem oriented learning.	Tests, topics and tasks of open/closed type. Presentati scientific article.
Ability to apply scientific principles, methods and knowledge in medical practice and research: To apply scientific principles, methods and knowledge in medical practice and research.	Lectures and seminars in auditorium; Exercises and tutorials in auditoriums and laboratories, self-study.	Presentation, scientific artic

Content: breakdown of the topics	**Contact hours**							**Self-study work: time and assignments**	
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/ work placement	**Contact hours**	**Self-study hours**	**Assignments**
Laboratory medicine in the personalized medicine era.	**2**								
Liver functions and the importance of their assessment for diagnosis. Liver syndromes. Differential laboratory diagnosis of jaundice. Bilirubin metabolism, its markers and their interpretation. Enzymatic laboratory diagnostics of Liver diseases.			**2**	**2**					Self-study and preparation to a seminars and laboratory work about Liver functions and Liver syndromes, Bilirubin metabolism; Jaundice differential diagnosis.
Plasma proteins and their clinical interpretation. Microalbuminuria. Nitrogenous compounds (BUN).			**2**	**2**					

Human plasma lipids, lipoproteins: turnover, detection principles. Dyslipoproteinemia and its laboratory diagnosis. Cardiac markers and laboratory diagnosis of myocardial infarction.			**2**	**2**					Self-study and preparation to a seminars and laboratory work about Atherosclerotic process biochemistry and principles of laboratory diagnosis and Human plasma lipids, lipoproteins: turnover, detection principles; Dyslipoproteinemia and its laboratory diagnosis.
Blood glucose determination. Glucose tolerance test. Glycosylated hemoglobin. Laboratory Diagnosis of Diabetes Mellitus.			**2**	**2**					Self-study and preparation to a seminars and laboratory work about Carbohydrate methabolism and Laboratory Diagnosis of Diabetes Mellitus.
Disbalance of acid-base and electrolytes - practical application in diagnosis of emergency conditions.			**2**	**2**					Self-study and preparation to a seminars and laboratory work about Cardiac markers and laboratory diagnosis of myocardial infarction; Disbalance of acid-base and electrolytes - practical application in diagnosis of emergency conditions.
Laboratory diagnosis of coagulation disorders. Coagulation parameters and their clinical interpretation, evaluation of anticoagulant treatment efficacy.			**2**	**2**					Self-study and preparation to a seminars and laboratory work about Coagulation parameters and their clinical interpretation.

Principles of laboratory hematology investigation. Automated CBC and its interpretation. Blood smear cytology and its interpretation. Laboratory evaluation and clinical interpretation of red blood cell indices. Laboratory diagnosis of anemia.			**4**	**4**					Self-study and preparation to a seminars and laboratory work about Automated CBC and its interpretation; Blood smear cytology and its interpretation. Reticulocytes and its assessement; ESR and its clinical significance.
Laboratory evaluation and clinical interpretation of leukocyte and platelet indices. Laboratory diagnosis of acute leukemias. Laboratory diagnosis of chronic leukemias.			**4**	**4**					Self-study and preparation to a seminars and laboratory work about evaluation and clinical interpretation of Red blood cell indices; Laboratory diagnosis of anemia.
Laboratory urine analysis. Cytological study of the body fluids and tissue.			**4**	**4**					Self-study and preparation to a seminars and laboratory work about Laboratory urine analysis, body tissue and fluid cytological analysis and interpretation.
Clinical microbiology. Antimicrobial susceptibility testing and interpretation. Laboratory diagnostic principles of infection.			**4**	**4**					
Laboratory immunology. Laboratory diagnostics of autoimmune diseases. Laboratory testing of immune status.			**2**	**2**					Self-study and preparation to a seminars and laboratory work about Laboratory immunology test interpretation.
Tutorial			**2**						
Iš viso	**2**		**34**	**32**			**68**	**67**	

Assessment strategy	**Weight, %**	**Deadline**	**Assessment criteria**
Exam in writing	100%	During exam session	Exam consists of open questions, each question is scored vidually, and then average total score is produced. Exam is assessed in 10 point scale according to the syste proved by VU regulations.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or web link
Compulsory reading				
Richard A. McPherson, MD, MSc and Matthew R. Pincus, MD, PhD	2022	Henry's Clinical Diagnosis and Management by Laboratory Methods	24th Edition	Elsevier
Optional reading				
Michael Laposata	2019	Laboratory Medicine: The Diagnosis of Disease in the Clinical Laboratory	3rd Edition	McGraw-Hill Education
Carl A. Burtis, PhD, Edward R. Ashwood, MD and David E. Bruns, MD	2018	Tietz Textbook of Clinical Chemistry and Molecular Diagnostics	6th Edition	Saunders