COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Medical Microbiology (2023-2024)	**MMIK2215**

Lecturer(s)	Department(s) where the course unit (module) is delivered
Coordinator: Prof. Dr. Tomas Kačergius **Other(s):** Assoc. Prof. Dr. Agnė Kirkliauskienė	Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, M. K. Čiurlionio str. 21, LT-03101 Vilnius, Lithuania

Study cycle	Type of the course unit (module)
Integrated studies (I and II levels)	Compulsory

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Face-to-face (lectures and seminars; laboratory works in microbiology laboratory)	4th semester	Lithuanian, English

Requirements for students	
Prerequisites: A student must have completed the following courses: human biology and genetics; human anatomy; human histology; biochemistry; physiology; general microbiology and immunology.	**Additional requirements (if any):** None

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5 credits	134 hours	67	67

Purpose of the course unit (module): programme competences to be developed		
To learn morphological, physiological, cultural, biochemical and pathogenic characteristics of the medically important pathogenic microorganisms, virulence factors and their implication for the disease pathogenesis, immunity, principles of the microbiological identification and protective measures; to gain the basic research concepts in solving problems that occur during physician practice, and that are related to the interaction between pathogenic microorganisms and human.		
Learning outcomes of the course unit (module)	**Teaching and learning methods**	**Assessment methods**
Generic competences After successful completion of the course unit (module), student will be able:		
To act honestly and follow ethical obligations; to apply the principles of good medical practice in the work; to be emphatic; to be capable for thinking critically and self-critically; to be creative and initiative; to know how to pursue the purpose; to be capable for communicating with others.	Lectures, seminars and laboratory works	Assessment of the tasks and self-study work.
To analyze and synthesize; to learn during the further studies and learn independently during the lifetime; to be capable for application of the knowledge in the practice; to be capable for teaching others; to be capable for carrying out the scientific investigations.	Lectures, seminars and laboratory works.	Assessment of the tasks and self-study work.
Subject specific competences After successful completion of the course unit (module), student will be able:		
To select, analyze and systemize microbiology literature as	Lectures, seminars and	Continuous assessment of

well as scientific publications in the field of medical microbiology.	laboratory works as well as self-study using library and internet resources.	the laboratory works and oral quizzes during seminars. Evaluation of the written quizzes. At the end of course unit – exam in the written form.
To understand and know how to carry out microbiological analysis – to examine microscopically the microbiological smear, perform cultivation, identify the pathogenic microorganisms using microbiological and immunological methods.	Lectures, seminars and laboratory works as well as self-study using library and internet resources.	Continuous assessment of the laboratory works and oral quizzes during seminars. Evaluation of the written quizzes. At the end of course unit – exam in the written form.
To understand principles of the microbiological identification of medically important microorganisms: to know what must be investigated, what methods must be applied, know how to evaluate the results of investigation.	Lectures, seminars and laboratory works as well as self-study using library and internet resources.	Continuous assessment of the laboratory works and oral quizzes during seminars. Evaluation of the written quizzes. At the end of course unit – exam in the written form.

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**
1. Pathogenic cocci, bacteria of the genera *Bordetella* and *Haemophilus*: their characteristics, virulence factors, immunity, microbiological identification and protection.	4		3		2		**9**	**7**	To be prepared for the seminars and laboratory works about pathogenic cocci, bacteria of the genera *Bordetella* and *Haemophilus*: their morphological, physiological, cultural, biochemical and pathogenic characteristics, virulence factors and their implication for the disease pathogenesis, immunity, principles of the microbiological identification and protective measures.
2. Pathogenic enterobacteria, bacteria of the genera *Campylobacter*, *Helicobacter*, *Listeria*, *Brucella* and *Vibrio*: their characteristics, virulence factors, immunity, microbiological identification and protection.	5		6		3		**14**	**15**	To be prepared for the seminars and laboratory works about pathogenic enterobacteria, bacteria of the genera *Campylobacter*, *Helicobacter*, *Listeria*, *Brucella* and *Vibrio*: their morphological, physiological, cultural, biochemical and pathogenic characteristics, virulence factors and their implication for the disease pathogenesis, immunity, principles of the microbiological identification and protective measures.
3. Pathogenic bacteria of the genera *Bacillus*, *Francisella*, *Corynebacterium*, *Mycobacterium*, *Legionella*, *Pseudomonas* and anaerobic bacteria: their characteristics, virulence factors, immunity, microbiological identification and protection.	5		4		2		**11**	**14**	To be prepared for the seminars and laboratory works about pathogenic bacteria of the genera *Bacillus*, *Francisella*, *Corynebacterium*, *Mycobacterium*, *Legionella*, *Pseudomonas* and anaerobic bacteria: their morphological, physiological, cultural, biochemical and pathogenic characteristics, virulence factors and their implication for the disease

									pathogenesis, immunity, principles of the microbiological identification and protective measures.
4.	Pathogenic spirochetes, rickettsiae, chlamydia and mycoplasma: their characteristics, virulence factors, immunity, microbiological identification and protection.	4		3		1		**8**	**8**	To be prepared for the seminars and laboratory works about pathogenic spirochetes, rickettsiae, chlamydia and mycoplasma: their morphological, physiological, cultural, biochemical and pathogenic characteristics, virulence factors and their implication for the disease pathogenesis, immunity, principles of the microbiological identification and protective measures.
5.	Pathogenic fungi and protozoa: their characteristics, virulence factors, immunity, microbiological identification and protection.	4		3		1		**8**	**7**	To be prepared for the seminars and laboratory works about pathogenic fungi and protozoa: their morphological, physiological, cultural, biochemical and pathogenic characteristics, virulence factors and their implication for the disease pathogenesis, immunity, principles of the microbiological identification and protective measures.
6.	Pathogenic viruses: their characteristics, virulence factors, immunity, microbiological identification and protection.	10		6		1		**17**	**16**	To be prepared for the seminars and laboratory works about pathogenic viruses: their morphological, structural, replication, cultivation and pathogenic characteristics, virulence factors and their implication for the disease pathogenesis, immunity, principles of the microbiological identification and protective measures.
	Total	**32**		**25**		**10**		**67**	**67**	

Assessment strategy	**Weight, (%)**	**Deadline**	**Assessment criteria**
Quizzes	10%	During semester	There are two written quizzes in spring semester, during which the student reports for the defined sections of the course unit “Medical Microbiology” in written form. The quizzes consist of the closed and/or opened type questions. The written quizzes are evaluated using grades in the scale of ten-point system, and they are recognized as positive, when the obtained grades are in the scale from 5 to 10 points.
Final exam	90%	During session	The final exam of the course unit “Medical Microbiology” consists of written answers to the closed and/or opened type questions, covering whole information provided in lectures, seminars and laboratory works of the course unit “Medical Microbiology”. The final exam is evaluated using grades in the scale of ten-point system, and it is considered to be passed positively, when the obtained grade is in the scale from 5 to 10 points. The final cumulative grade consists of: 90% – positive grades of the final exam; 10% – positive grades obtained from the written quizzes during spring semester. The meaning of grades of the ten-point system: 10 (excellent) – excellent performance, outstanding knowledge and skills; 9 (very good) – strong performance, good knowledge and

			skills; 8 (good) – above the average performance, knowledge and skills; 7 (highly satisfactory) – average performance, knowledge and skills with unessential shortcomings; 6 (satisfactory) – below average performance, knowledge and skills with substantial shortcomings; 5 (sufficient) – knowledge and skills meet minimum criteria; 4, 3, 2, 1 (insufficient) – knowledge and skills do not meet minimum criteria/below minimus criteria.

Author	**Year of publication**	**Title**	**Issue of a periodical or volume of a publication**	**Publishing place and house or web link**
Compulsory reading				
P. R. Murray, K. S. Rosenthal, M. A. Phaller	2020	Medical Microbiology	9th edition	Philadelphia, Elsevier Inc.
Optional reading				
K. C. Carroll, J. A. Hobden, S. Miller, S. A. Morse, T. A. Mietzner, B. Detrick, T. G. Mitchell, J. H. McKerrow, J. A. Sakanari	2016	Jawetz, Melnick, & Adelberg's Medical Microbiology	27th edition	New York, McGraw-Hill Education, AccessMedicine: http://accessmedicine.mhmedical.com/content.aspx?bookid=1551&sectionid=94104942