

Course Syllabus

I. General Information

Course name	Medical microbiology
Programme	BSc
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	part-time
Form of studies (full-time, part-time)	Biological sciences
Discipline	English
Language of instruction	BSc

Course coordinator/person responsible	dr Monika Jach
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Type of class (<i>use only the types mentioned below</i>)	Number of teaching hours	Semester	ECTS Points
lecture	30	IV	6
tutorial			
classes	30	IV	
laboratory classes			
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Knowledge in the field of: general microbiology and biochemistry with enzymology
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II. Course Objectives

Upon completion of this course students will be able to describe: how the biology of bacteria and fungi leads to human disease; and how humans try to prevent or treat these diseases.
Students will be able to explain the rules by microbiologists to identify and characterize organisms.
Acquainting with the principles of microbiological testing, including isolation and identification of microorganisms
The acquisition of skills by the student perform the microbiological examination, including the isolation and identification of microorganisms

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	students know the basic terminology used in microbiology, understand and can define the basic phenomena and processes of physiological and pathological forms of intercourse microorganisms,	K_W01
W_02	students have a basic knowledge of the most important groups of microorganisms that cause human infection and their pathogenic potential and their practical impact on various industries	K_W04
W_03	students have knowledge of the principles of planning and development of microbiological tests using the research techniques and tools used in microbiology	K_W04, K_W05
W_04	Presents issues in the field of biochemistry and biology necessary for practical use in biotechnological processes used in the pharmaceutical industry and medicine	K_W08
W_05	students have knowledge of the basic principles of safety, occupational hygiene and ergonomics, indicate the psychophysical abilities of a man who works in a microbiological laboratory	K_W09
SKILLS		
U_01	students use and implement research techniques and tools including the identification and differentiation of microorganisms. Students use the acquired knowledge and apply in practice the regime of dealing with infectious material	K_U01, K_U02
U_02	students are able to use a light microscope, prepare microscopic specimens himself, conduct and document microorganisms observations,	K_U03
U_03	students will conduct a classic procedure to identify basic pathogens, collect and interpret the results of diagnostic tests and on this basis formulate appropriate conclusions, can prepare a report	K_U01, K_U11, K_U12, K_U13
U_04	designs and performs research tasks or expertise in the field of chemistry, biochemistry and biology	K_U15
U_05	learns independently in a targeted manner in the field of microbiological techniques in medicine, updates his knowledge and skills, applies new research techniques and plans his professional development	K_U17
SOCIAL COMPETENCIES		
K_01	is prepared to evaluate his own knowledge and skills as well as obtained information, he complies ethical aspects in scientific research in the field of microbiology	K_K01
K_02	identifies and explains dilemmas related to the development of biotechnology and the importance of biotechnology in medicine, uses the opinions of experts	K_K02

K_03	possesses appropriate habits required to the work in a microbiological laboratory, especially in aseptic conditions, proceeds according to work safety regulations, knows how to react in states of danger	K_K04
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IV. Course Content

Students are familiar with the safety rules in microbiological laboratory: principles of laboratory organization and conditions of safe work in the laboratory. Review and current systematics of the most important pathogenic microorganisms; including obligatory and opportunistic pathogens - morphology, identification, virulence factors and pathogenicity, laboratory diagnosis, culture conditions, identification, growth characteristics, monitoring pigments. Basics of differentiation and methods of microbial cultures. Detailed diagnostics of selected pathogens by traditional and molecular methods. Isolation and identification of microorganisms, sensitivity to antibiotics and resistance mechanisms, serological reactions. Students are introduced to the issue of indirect diagnosis of infectious diseases using the most significant methods. They read the results of the methods and interpret them. Microbiological safety of drugs, foodstuffs, water and air, including microbiological purity testing methods.

Topics of Medical Microbiology exercises

Exercise 1. Theoretical and practice explanation of organisation of work and occupational health and safety regulations applicable in microbiological laboratory.

Exercise 2. Differentiation and identification of Staphylococcus species.

Exercise 3. Differentiation and identification of Streptococcus and Enterococcus

Exercise 4. Written test covering exercises 1-3.

Exercise 5. Non-spore-forming Gram-positive rods, if always threatening the health and life? Listeria and Lactobacillus

Exercise 6. Differentiation and identification of aerobic bacilli - Bacillus

Exercise 7. The clinical significance of aerobic gram-negative rods Pseudomonas and related bacteria.

Exercise 8. Written test covering exercises 5-7

Exercise 9 Isolation and identification of Enterobacteriaceae.

Exercise 10. Anaerobic bacilli – Clostridium

Exercise 11. Yeast infections. Candida and Cryptococcus neoformans

Exercise 12. Written test covering exercises 9-12.

Exercise 13-14. Microbiological safety of medicines, foods, water and air, including the methods of microbiological purity. Practical test.

Exercise 15. Summary and closing exercises.

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods (choose from the list)	Forms of assessment (choose from the list)	Documentation type (choose from the list)
KNOWLEDGE			
W_01	Conventional lecture discussion	exam written test	Evaluated written paper Evaluated written test
W_02	Conventional lecture discussion	exam written test	Evaluated written paper Evaluated written test
W_03	Conventional lecture discussion	exam written test	Evaluated written paper Evaluated written test
W_04	discussion	written test	Evaluated written test

W_05	Conventional lecture discussion	exam Written test	Evaluated written test
SKILLS			
U_01	Laboratory classes	Written test	Evaluated written test
U_02	Laboratory classes	Written test	Evaluated written test
U_03	Laboratory classes	written test report	Evaluated written test Report printout
U_04	Laboratory classes	Written test	Evaluated written test
U_05	Laboratory classes	Written test	Evaluated written test
SOCIAL COMPETENCIES			
K_01	Laboratory classes	Test of practical skills	Rating card
K_02	Laboratory classes	Test of practical skills	Rating card
K_03	Laboratory classes	Test of practical skills	Rating card

VI. Grading criteria, weighting factors.....

Lecture: 100% mark from an exam

Classes: 80% mark from written tests and written short tests, 10% written reports of the exercises, 10% assessment of work during the classes

Mark	Evaluation criteria	
verygood (5)	the student realizes the assumed learning outcomes at a very good level	the student demonstrates knowledge of the education content at the level of 91-100%
overgood (4.5)	the student accomplishes the assumed learning outcomes an over good level	the student demonstrates knowledge of the education content at the level of 86-90 %
good(4)	the student accomplishes the assumed learning outcomes at a good level	the student demonstrates knowledge of the education content at the level of 71-85%
Quite good(3.5)	the student accomplishes the assumed learning outcomes at a quite good level	the student demonstrates knowledge of the education content at the level of 66-70%
sufficient (3)	the student accomplishes the assumed learning outcomes at a sufficient level	the student demonstrates knowledge of the education content at the level of 51-65%
insufficient (2)	the student accomplishes the assumed learning outcomes at an insufficient level	the student demonstrates knowledge of the education content below the level of 51%

VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	60
Number of hours of individual student work	90

VIII. Literature

Basic literature
Murray P.R., Rosenthal K.S. Pfaller M.A. Medical Microbiology. Elsevier Inc. Philadelphia
Additional literature
Baron S. (ed.) Medical Microbiology. University of Texas Medical Branch at Galveston, Galveston, Texas.
Jorgensen J.H., Pfaller M.A., Carroll K.C., Funke G., Landry M.L., Richter S.S., Warnock D.W. Manual of Clinical Microbiology. Am. Society Microbiology