

Module name	Medical microbiology - an extensive course
Module code	B-MI.237
ISCED code	0511: Biology
Study cycle	I and II°
Semester	Summer semester
Responsible for this module	dr hab. Sylwia Wdowiak-Wróbel, prof. UMCS e. mail: s.wdowiak@poczta.umcs.lublin.pl
Language of instruction	English
Website	-
Prerequisites	Biology course and/or General Microbiology course
ECTS	8
ECTS points hour equivalents	Contact hours (work with an academic teacher) Lecture – 30 hours; Laboratory – 60 hours. Total number of hours with an academic teacher 120 Number of ECTS points with an academic teacher 4 Non-contact hours (students' own work) 120 - preparation for the exam: 42 - preparation for labs: 38 - preparation of reports from laboratory exercises: 15 - literature study: 25 Total number of non-contact hours 120 Number of ECTS points for non-contact hours 4 Total number of ECTS points for the module = 8
Learning outcomes verification methods	participation in classes and mid-semester written tests (50% + 1 correct answer) The written test exam
Course full description	The module covers the knowledge in the area of bacteria that cause human diseases. Basic information on human microbiome and medically important pathogens: Gram-positive cocci (<i>Staphylococcus</i> , <i>Streptococcus</i> , <i>Enterococcus</i>), Gram-positive spore-forming (<i>Bacillus</i> , <i>Clostridium</i>), anaerobic infections (<i>Bacteroides</i> , <i>Porphyromonas</i> , <i>Prevotella</i> , <i>Fusobacterium</i>), Gram-negative bacilli (<i>Enterobacterales</i> - <i>Yersinia</i> , <i>Salmonella</i> , <i>Shigella</i> , <i>Escherichia</i> , coliforms, <i>Klebsiella</i> , <i>Proteus</i>), Gram-negative bacilli oxidase positive (<i>Pseudomonas</i> , <i>Burkholderia</i>), Gram-negative curved bacilli (<i>Vibrio</i> , <i>Campylobacter</i> , <i>Helicobacter</i>), Gram-negative coccobacilli (<i>Brucella</i> , <i>Bordetella</i>), fastidious Gram-negative bacteria (<i>Neisseria</i> , <i>Haemophilus</i>), HACEK group infections, <i>Legionella</i> , <i>Coxiella</i> , animal-associated bacteria (<i>Erysipelotrix</i> , <i>Francisella</i> , <i>Pasteurella</i> , <i>Mannheimia</i>), spirochetes (<i>Treponema</i> , <i>Leptospira</i> , <i>Borrelia</i>), Gram-positive bacilli (<i>Listeria</i> , <i>Corynebacteria</i> , <i>Mycobacteria</i>), obligate intracellular bacteria (<i>Rickettsia</i> , <i>Chlamydia</i> , <i>Chlamydophila</i>), cell wall-less bacteria (<i>Mycoplasma</i> , <i>Ureaplasma</i>). Identification of bacterial pathogens using molecular biology and microbiological techniques, examination of infections of the human body systems, ways and mechanisms of infection, prevention, and treatment. Basic aspects of antimicrobial chemotherapy. Laboratory classes Introduction to Medical Microbiology Laboratory safety principles Principles of microbiological examination

	<p>Specimen selection and processing Identification of pathogens (<i>Staphylococcus</i> spp.; <i>Streptococcus</i> spp.; <i>Haemophilus</i> spp.; <i>Pseudomonas</i> spp.; Enterobacteriaceae e.g. <i>Escherichia</i>, <i>Serratia</i>, <i>Klebsiella</i>, <i>Salmonella</i>; <i>Yersinia</i> spp., <i>Corynebacterium</i> spp., <i>Listeria</i> spp., <i>Erysipelothrix rhusiopathiae</i>, <i>Moraxella catarrhalis</i>) by clinical tests - Gram staining method, growth media for various microbiological tests, biochemical tests, Detection of bacterial pathogens using a PCR assay Urinary tract infections Antimicrobial susceptibility testing <i>in vitro</i></p>
Bibliography	<ol style="list-style-type: none"> 1. Harrison's Infectious Diseases. by Dennis L. Kasper, Anthony S. Fauci, 2. Microbiology with diseases by body system. 4th ed. By R.W. Bauman, 3. Medical Microbiology by F.H. Kayser, K.A. Bienz, J. Eckert, R.M. Zinkernagel 4. Practical Manual of Medical Microbiology by C.P. Prince 5. Medical Microbiology, Jawetz, Melnick, Adelberg's 6. Medical Microbiology, P. Murray, K. Rosenthal, M. Pfaller
Learning outcomes	<p>KNOWLEDGE -The course provides a basic theoretical and technical study of the structure, molecular biology, pathogenesis, epidemiology, and laboratory identification of the bacteria that cause human diseases. The student can convert the acquired theoretical background knowledge into actual practice in the course of experiments.</p> <p>SKILLS -To recognize the basic etiological factors of human bacterial infective diseases. -differentiation of bacterial pathogens from harmless bacteria that colonize humans -Acquire the practical knowledge used in medical microbiology</p> <p>SOCIAL COMPETENCES -Develop skills in critical review of microbiology literature helpful in solving of diagnostics problems of bacterial diseases in humans Isolation and culturing of bacteria.</p> <p><u>Laboratory classes</u> KNOWLEDGE -Microscopic examination of bacterial morphology by different staining methods. -Examination and identification of selected groups of pathogenic bacteria by using laboratory detection methods: molecular, morphological, immunological and cultural. -Examination of factors affecting disease spread. -Biochemical and serological tests for identification of different group of bacteria. -Evaluation of the efficacy of antimicrobial agents; determination of MIC and MBC.</p>

	<p>-Performance of suitable PCR methods for virulence factors detection.</p> <p>SKILLS</p> <ul style="list-style-type: none"> -Theory and practice, with diagnostics of the bacterial etiological agents of infectious diseases -Up-to-date knowledge of infectious diseases -Acquire the practical knowledge and skills used in medical microbiology and safe work practices in microbiology - Capability to work as a scientist in a research or diagnostic microbiology laboratory <p>SOCIAL COMPETENCES</p> <ul style="list-style-type: none"> -Applying the obtained knowledge for diagnostics and antimicrobial proceeding of bacteria that cause disease in humans
Practice	not concerns
Teaching methods	Laboratory experiments; presentation, discussion