MICROBIOLOGY

1. IMPRINT	
Academic Year	2022/2023
Department	Faculty of Medicine
Field of study	Medicine
Main scientific discipline *(in accord with appendix to the Regulation of Minister of Science and Higher educatio from 26th of July 2019)*	Medical science
Study Profile *(general academic / practical)*	General academic
Level of studies *(1st level /2nd level/ uniform MSc)*	Uniform MSc
Form of studies	Full-time studies
Type of module / course *(obligatory / non-compulsory)*	Obligatory
Form of verification of learning outcomes *(exam / completion)*	Exam
Educational Unit / Educational Units *(and address / addresses of unit / units)*	Chair and Department of Medical Microbiology 5 Chałubińskiego Street 02-004 Warsaw, Poland (+4822) 628 27 39 http://mikrobiologia.wum.edu.pl

Head of Educational Unit / Heads of Educational Units	Prof. dr hab. Hanna Pituch (e-mail: hanna.pituch@wum.edu.pl)
Course coordinator *(title, First Name, Last Name, contact)*	dr n. med. Robert Kuthan (e-mail: rkuthan@wum.edu.pl)
Person responsible for syllabus *(First name, Last Name and contact for the person to whom any objections concerning syllabus should be reported)*	Prof. dr hab. Hanna Pituch (e-mail: hanna.pituch@wum.edu.pl) dr n. med. Robert Kuthan (e-mail: rkuthan@wum.edu.pl)
Teachers	dr Robert Kuthan, lek Gabriel Zaremba-Wróblewski, dr hab. Maciej Przybylski, dr hab. Anna Henriques dos Santos de Sepulveda

2. BASIC INFORMATION

Year and semester of studies	3rd year, semester V and VI	**Number of ECTS credits**	6

FORMS OF CLASSES **Contacting hours with academic teacher**	**Number of hours**	**ECTS credits calculation**
Lecture (L)	-	-
Seminar (S)	10	0,5
Classes (C)	70	3,5
e-learning (e-L)	-	-
Practical classes (PC)	-	-
Work placement (WP)	-	-
Unassisted student's work		
Preparation for classes and completions	50	2,0

3. COURSE OBJECTIVES

O1	Composition and role of human microbiome.
O2	Basic properties of pathogenic species of microorganisms.
O3	Laboratory diagnosis of infections in humans.
O4	Principles of antimicrobial treatment and prophylactic measures.

O5	Principles of rational chemotherapy.
O6	Basic laboratory techniques, operation of simple measuring instruments, assessment of the accuracy of performed measurements important for proper cooperation between doctor and microbiologist in diagnosis of infectious diseases.

4. STANDARDS OF LEARNING – DETAILED DESCRIPTION OF EFFECTS OF LEARNING *(concerns fields of study regulated by the Regulation of Minister of Science and Higher Education from 26 of July 2019; does not apply to other fields of study)*

Code and number of effect of learnir in accordance with standards of learning *(in accordance with appendix to the Regulation of Minister of Science and Higher education from 26th of July 2019)*	**Effects in time**
Knowledge – Graduate* knows and understands:	
G.K1/ C.W11	genetic mechanisms for the acquisition of drug resistance by microorganisms and tumor cells;
G.K2/ C.W12	classify microorganisms, with consideration of pathogenic and present in the physiological flora;
G.K3/ C.W13	epidemiology of infections with viruses and bacteria, fungi and parasites including geographical coverage of their distribution;
G.K4/ C.W14, C.W15	abiotic and biotic (viruses, bacteria) effects of the environmental factors on the human body and the population of people and the way of their entering the human body; consequences of exposure of the human body to various chemical and biological factors and the principle of prevention;
G.K5/ C.W16	invasive forms or developmental stages of selected parasitic fungi, protozoa, helminths, and arthropods, taking into account the geographical range of their occurrence;
G.K6/ C.W18	symptoms of iatrogenic infections, roads of their spread and pathogens causing changes in individual organs;
G.K7/ C.W19	basics of microbiological and parasitological diagnostics;
G.K8/ C.W20	basics of disinfection, sterilization and aseptic procedures;
G.K9/ C.W33	external and internal pathogens, modifiable and non-modifiable;
G.K10/ C.W40	understands the problem of drug resistance, including multi-drug resistance.
Skills– Graduate* is able to:	
G.S1/ C. U6	assesses environmental threats and uses basic methods allowing to detect the presence of harmful factors (biological and chemical) in the biosphere;
G.S2/ C. U9	formulates a microscopic preparation and recognizes pathogens under the microscope;

G.S3/ C. U10	interprets the result of microbiological tests;
G.S4/ C. U15	designs rational regiment of chemotherapy of infections, empirical and targeted;
G.S5/ B.U9	uses simple measuring instruments and assesses the accuracy of measurements
G.S6/ D.U17	critically analyzes medical literature, and draws conclusions.

** In appendix to the Regulation of Minister of Science and Higher education from 26th of July 2019 „graduate", not student is mentioned.*

5. ADDITIONAL EFFECTS OF LEARNING *(non-compulsory)*

Number of effect of learning	Effects of learning and time
Knowledge – Graduate knows and understands:	
-	not applicable
Skills– Graduate is able to:	
-	not applicable
Social Competencies – Graduate is ready for:	
K1	The graduate is aware of his own limitations and skills.

6. CLASSES

Form of class	Class contents	Effects of Learning
Classes	1. Pathogenic properties of microorganisms. Basics of diagnosis of bacterial infections (culture and microscopic methods).	G.K7, G.S1, G.S2 / C.W19, C.U6, C.U9
	2. Sterilization and disinfection.	G.K8 / C.W20
	3. Gram-positive and Gram-negative cocci.	G.K2, G.K3, G.K4, G.K7, G.K9, G.S2, G.S5 / / C.W12, C.W13, C.W14, C.W15, C.W19, C.W33, C.U9, B.U9
	4. Gram-negative bacilli.	G.K2, G.K3, G.K4, G.K7, G.K9, G.S2, G.S5 / C.W12, C.W13, C.W14, C.W15, C.W19, C.W33, C.U9, B.U9
	5. Strictly anaerobic bacteria.	G.K2, G.K3, G.K4, G.K7, G.K9, G.S2, G.S5 / C.W12, C.W13, C.W14, C.W15, C.W19, C.W33, C.U9, B.U9
	6. Gram-positive bacilli and Mycobacteria.	G.K2, G.K3, G.K4, G.K7, G.K9, G.S2, G.S5 / C.W12, C.W13, C.W14, C.W15, C.W19, C.W33, C.U9, B.U9

	7. Susceptibility of bacteria to antibacterial agents. Alarm pathogens detection.	G.K1, G.K10, G.S5 /C.W11, C.W40, B.U9
	8. Pathogenic fungi. Mycotoxins. Antifungal drugs.	G.K2, G.K3, G.K5, G.K7, G.S2, G.S5 / C.W12, C.W13, C.W16, C.W19, C.U9, B.U9
	9. Microbiota. Opportunistic infections.	G.K2, G.K3, G.K4, G.K8, G.K2, G.K3, / C.W12, C.W13, C.W 14, C.W20, C.U10
	10. Viruses pathogenic for humans and methods of microbiology laboratory diagnosis. DNA viruses.	G.K3, G.K4, G.K6, G.S1, G.S6 / C.W13, C.W14, C.W15, C.W18, C.U6, D.U17
	11. Viruses pathogenic for humans and methods of microbiology laboratory diagnosis. RNA viruses.	G.K3, G.K4, G.K6, G.S1, G.S6 / C.W13, C.W14,, C.W15, C.W18, C.U6, D.U17
	12. Respiratory tract infections.	G.K6, G.K7, G.S1, G.S3, G.S4, G.S5 / C.W18, C.W19, C.U6, C.U10, C.U15, B.U9, K1
	13. Urinary tract infections.	G.K6, G.K7, G.S1, G.S2, G.S3, G.S4, G.S5, / C.W18, C.W19, C.U6, C.U9, C.U10, C.U15, B.U9, K1
	14. Gastrointestinal tract infections.	G.K6, G.K7, G.S1, G.S2,G.S3, G.S4, G.S5 / C.W18, C.W19, C.U6, C.U9, C.U10, C.U15, B.U9, K1
	15. Skin infections and wounds.	G.K6, G.K7, G.S1, G.S2, G.S3, G.S4, G.S5 / C.W18, C.W19, C.U6, C.U9, C.U10, C.U15, B.U9, K1
	16. Nervous system infections. Prion diseases.	G.K6, G.K7, G.S1, G.S2, G.S3, G.S4, G.S5 / C.W18, C.W19, C.U6, C.U9, C.U10, C.U15, B.U9, K1
	17. Bloodstream infection. Hospital acquired infections.	G.K6, G.K7, G.S1, G.S2, G.S3, G.S4, G.S5 / C.W18, C.W19, C.U6, C.U9, C.U10, C.U15, B.U9, K1
Seminars	Seminar 1. Serological and genetic methods in diagnosis of infections. Laboratory diagnosis of hepatitis viruses.	G.K1, G.K7, G.S3 / C.W11, C.W19, C.U10
	Seminar 2. Mechanisms of resistance of bacteria to antibiotics.	G.K1, G.K10, G.S4, G.S5 / C.W11, C.W40, C.U15, B.U9
	Seminar 3. Sexually transmitted microorganisms. Vertically transmitted infection. Perinatal infection.	G.K3, G.K4, G.K5, G.K7, G.K9, G.S1, G.S3, G.S6 / C.W13, C.W14, C.W18, C.W33, C.U10, D.U17

7. LITERATURE

Obligatory

1. **Medical Microbiology, P.R. Murray, K.S. Rosenthal and M.A. Pfaller. Elsevier. 9th ed. 2020**
2. Textbook of Diagnostic Microbiology, C. R. Mahon, D. C. Lehman, 6th Ed., Elsevier 2019.
3. Training materials provided by the Chair and Department of Medical Microbiology on the e-learning platform

Supplementary

4. Medical Microbiology, Jawetz, Melnick, & Adelberg's Medical Microbiology, 28th ed. New York, McGraw-Hill, 2019.
5. The European Committee on Antimicrobial Susceptibility Testing – EUCAST - Guidelines and Rationale Documents. https://www.eucast.org/

8. VERIFYING THE EFFECT OF LEARNING

Code of the course effect of learning	Ways of verifying the effect of learning	Completion criterion
G.K1 G.K2 G.K3 G.K4 G.K5 G.K6 G.K7 G.K8 G.K9 G.K10 G.S1 G.S2 G.S3 G.S4 G.S5 G.S6 / C.W11, C.W12, C.W13, C.W14, C.W15, C.W16, C.W18, C.W19, C.W20, C.W33, C.W40, C.U6, C.U9 C.U10, C.U15, B.U9, D.U17, K1	**Colloquiums** Colloquium 1: range of topics: exercises 1 - 4, theoretical and oral colloquium, 3 open-ended questions. Colloquium 2: range of topics: exercises 5 - 8, theoretical and written colloquium, 4 open-ended questions. Colloquium 3: range of topics: exercises 9 - 11, seminar 1, theoretical and written colloquium, 4 open-ended questions. Colloquium 4: range of topics: exercises 12-17, seminars: 2 and 3, practical and oral colloquium, 3 tasks: 1. Preparation and discussion of microscopic slides. 2. Discussion of epidemiology and diagnostic procedures of a system infection. 3. Interpreting the result of the diagnostic test. Re-take of failed colloquium: 7 days after 1st term. Commission colloquium (2nd re-take): oral in front of 2-3 teachers. Date: Consequence of failure: microbiology course not completed. **Final exam** Date of exam: summer examination session Number of questions: 80 Format of questions: MCQ. Each question is rated on a point scale: 0 or 1. The passing criterion is to obtain ≥41 points (50% + 1 point) Any complaint to the examination questions must be written during or right after the exam, but before leaving the examination room. The complaint must include: student's name and/or index number, examination test version, question number, substantiation for the complaint. **Re-take of the Final exam** Date of exam: re-take examination session Format of questions: Students will be informed about the date and form of the exam before the summer break.	The answer to each question is graded on a 0-6 scale. The criterion for passing the test (1-4) is to obtain ≥ 51%. Criteria for obtaining grades: 2.0 (fail / ndst) - 0-40 points 3.0 (satisfactory / dst) – 41-48 points 3.5 (better than satisfactory / ddb) - 49- 56 points 4.0 (good / db) – 57-64 points 4.5 (better than good / pdb) – 65-72 points 5.0 (very good / bdb) - ≥73 points

9. ADDITIONAL INFORMATION *(information essential for the course instructor that are not included in the other part of the course syllabus e.g. if the course is related to scientific research, detailed description of, information about the Science Club)*

As a preparation for the classes, before each class student should read subject related chapter from one of the books listed in the section 7 – Obligatory literature.

Classes starts on time, any student who came late will not be allowed to enter the classroom.

Laboratory classes are composed of theoretical and practical parts, which both are obligatory to participated in. Seminars classes are compulsory to participated in.

Student are NOT allowed to miss any classes during the whole course of microbiology.

In case of an absence (medical note is requested) student will have to write an essay on the missed subject. In case of more than 2 absences, (e.g. due to prolong hospitalization, natural disaster, etc.), situation will be analysed, and the decision if a student can continue the course is to be made individually in the agreement with the Dean.

Due to safety reason it is not possible to change group or participate in a class with another group.

During the classes, it is necessary to have protective clothing (lab coat) and, in the case of a special epidemic situation related to Covid-19, to wear personal protective equipment (disposable gloves, protective masks).

The laboratory classes are organized as practical activities. Students will be working with infectious material, therefore the following rules have to be observed:

- *hands must be washed and/or disinfected after each class,*
- **jewellery must be removed from hands/wrists for the time of classes,**
- **long hair must be tied back**
- *outer coats must be left in the cloakroom downstairs,*
- *protective gowns must be used in the laboratory classes room (brought to the first laboratory class and stored at the Department of Medical Microbiology for the duration of the course),*
- *eating, drinking, smoking (incl. e-cigarettes) is strictly forbidden.*

Students have the possibility of scientific cooperation with the Department as part of the activities of Student Scientific Associations (SKN):
1. SKN Microbiology at the Chair and Department of Medical Microbiology of the Medical University of Warsaw, tutor: dr hab. Ksenia Szymanek - Majchrzak, (xenia.szymanek@wum.edu.pl)
2. SKN Mycology "Mucor", tutor: dr Robert Kuthan (skn.mykologii@gmail.com, rkuthan@wum.edu.pl)