



Biology

1. IMPRINT

Academic Year	2026/2027
Department	Faculty of Medicine and Dentistry
Field of study / Subject	English Dentistry Division
Main scientific discipline	Medical sciences
Study Profile	General academic
Level of studies	Uniform MSc
Form of studies	Full-time program
Type of module / course	Obligatory
Form of verification of learning outcomes	Completion
Educational Unit / Educational Units	Department of Experimental Physiology and Pathophysiology Pawińskiego 3C, 02-106 Warszawa phon. 22 57 20 734; e-mail: 1s7@wum.edu.pl

Head of Educational Unit / Heads of Educational Units	Professor Marcin Ufnal, MD, PhD
Course coordinator	Professor Marcin Ufnal, MD, PhD phon. 22 57 20 734 mufnal@wum.edu.pl
Person responsible for syllabus	Marek Konop, MSc, PhD phon. (22) 57 20 734, e-mail: marek.konop@wum.edu.pl
Teachers	Marcin Ufnal, MD, PhD, mufnal@wum.edu.pl Adrian Drapała, MD, PhD, adrapala@wum.edu.pl Kinga Jaworska, MD, PhD kinga.jaworska@wum.edu.pl Marek Konop, MSc, PhD, marek.konop@wum.edu.pl Mateusz Szudzik, PhD, mateusz.szudzik@wum.edu.pl

2. BASIC INFORMATION

Year and semester of studies	1 st year, 1 st semester	Number of ECTS credits	1,5
FORMS OF CLASSES	Number of hours	ECTS credits calculation	
Contacting hours with academic teacher			
Lecture (L)	8 (6 in e-learning)	0,3	
Seminar (S)	10	0,4	
Discussions (D)	-	-	
e-learning (e-L)	-	-	
Practical classes (PC)	7	0,3	
Work placement (WP)	-	-	
Unassisted student's work			
Preparation for classes and completions	12	0,5	

3. COURSE OBJECTIVES

O1	Introduction to medical ecology.
O2	Studying the interactions in the parasite-host system.
O3	Acquiring knowledge molecular biology techniques.

4. STANDARDS OF LEARNING – DETAILED DESCRIPTION OF EFFECTS OF LEARNING

Code and number of effect of learning in accordance with standards of learning	General learning effects:
Knowledge – Graduate* knows and understands:	
B.W12.	basic concepts of biology and ecology
B.W13.	correlations between organisms in the ecosystem;
B.W14.	interactions in the parasite-host system
B.W15.	selected issues in genetics and molecular biology;
Skills– Graduate* is able to:	
B.U8.	use biological and ecological concepts in the context of human - living environment;

5. ADDITIONAL EFFECTS OF LEARNING

Number of effect of learning	Effects of learning in time
Knowledge – Graduate knows and understands:	
K1	-
Skills– Graduate is able to:	
S1	-
Social Competencies – Graduate is ready for:	
SC1	-

6. CLASSES

Form of class	Class contents	Effects of Learning
Lectures	L1 – Lecture 1: Medical aspects of ecology. Abiotic and biotic factors of the environment. Environmental impact on human health.	B.W12., B.W13.

	Structure of the environment. Interactions between organisms in ecosystem. Role of humans in the environment.	
	L2 – Lecture 2: Influence of bacteria and other microorganisms inhabiting a human being on human health. Definition of microbiota. Comparison of commensalism and mutualism. Factors affecting the composition of the human microbiota. Comparison of the composition of the microbiota of different areas of the body. The difference between carrier-state and disease. Positive contribution of the microbiota to the functioning of the human body. Negative contribution of the microbiota in the pathophysiology of diseases.	B.W13.
	L3 – Lecture 3: Interactions in the parasite-host system. Interspecies interactions. External versus internal parasites. Indirect and definitive hosts. Life cycles of parasites.	B.W13., B.W14.
	L4 – Lecture 4: External parasites - a source of dangerous diseases for the doctor. Division of external parasites. Ticks as disease vectors. Lyme disease. Mosquitoes as disease vectors. Malaria. Lice as disease vectors. Scabies.	B.W12.
Seminars and exercises		
	Molecular biology	
Seminars	S1 – Seminar 1: Mendelian genetics. Inheritance. Mendel's laws, autosomal dominant inheritance, autosomal recessive inheritance, X-chromosome coupled inheritance and mitochondrial inheritance. Principles of describing pedigrees.	B.W12., B.W15.
	S2 – Seminar 2: Mutagenesis. Description of the structure of genetic material, processes of replication, transcription and translation. Point mutations, structural aberrations of chromosomes, numerical aberrations of chromosomes, methods of repairing DNA damage.	B.W12., B.W15.
	S3 – Seminar 3: Molecular biology techniques used in mutation detection and diagnosis of human genetic diseases. Description of molecular biology methods used in detection of markers at the DNA, mRNA, protein level. PCR reaction and its modifications, NGS sequencing, western blot, ELISA.	B.W12., B.W15.
	Parasitology	
Exercises	E1 – Exercise 1: Protozoa – life cycles, diagnosis, treatment methods with examples of Plasmodium spp., Giardia lamblia, Trypanosoma brucei gambiense, Trypanosoma cruzi.	B.W12.-B.W14., B.U8.
	E2 – Exercise 2: Wrys and tapes – life cycles, diagnosis, treatment methods with examples of Fasciola hepatica, Dicrocoelium dendriticum, Echinococcus granulosus, Echinococcus multilocularis, Tenia saginata, Tenia solium, Hymenolepis nana.	B.W12.-B.W14., B.U8.
	E3 – Exercise 3: Nematode – life cycles, diagnosis, treatment methods with examples of Ascaris lumbricoides, Toxocara canis, Toxocara cati, Enterobius vermicularis and selected filariases.	B.W12.-B.W14., B.U8.
	E4 – Exercise 4: Parasitic insects – life cycles, diagnosis, treatment methods on the example of Argas reflexus, selected species of mosquitoes, ticks and mites.	B.W12.-B.W14., B.U8.

7. LITERATURE

Obligatory

1. Daviodovits P.: Physics in Biology and Medicine (5th ed.), Academic Press, Elsevier Books, 2018
2. Web Atlas of Medical Parasitology. <http://www.atlas.or.kr>
3. Molecular Biology 4th Edition. Robert F. Weaver, 2008.

Supplementary

1. Markell and Voge's Medical Parasitology. D.T. John, W.A. Petri. Saunders Company. 9th ed., 2006
- Molecular Biology. David P. Clark, Academic Press, 2018.

8. VERIFYING THE EFFECT OF LEARNING

Code of the course effect of learning	Ways of verifying the effect of learning	Completion criterion
B.W12.-B.W15., B.U8.	1. Verbal or written checking of preparation for each seminar or exercise. 2. Preparation of the presentation. The content, method of delivery and the ability to discuss are assessed. 3. Preparation of papers and other written assignments commissioned by lecturers. Fulfillment of the conditions in point. 1, 2 and 3 allows you to approach to the final test. Examination test (50 single-choice questions) checks acquire content presented in lectures, seminars and exercises. A student is entitled to three attempts to pass the course, with the second and third attempts being resit attempts.	Active participation in classes assessed on the basis of a short checking test. ≥ 60% of the maximum number of points

9. ADDITIONAL INFORMATION

1. Person responsible for teaching: professor Marcin Ufnal, MD, PhD (mufnal@wum.edu.pl)
2. Attendance at lectures, seminars and exercises is obligatory (attendance list).
3. The student is entitled to 1 unexcused absence. Other absences must be confirmed by a sick leave, which must be delivered to the Department's Secretariat within 7 days of returning to the University.
4. Any absence from class (including excused absences) must be made up. The form of the class to be made up must be defined with the Assistant in charge of that class.
5. Please arrive at the class on time. Being late over 15 minutes is treated as absence. It is strictly forbidden to use cell phones during the classes.
6. Exam - one-choice test, passed >60% of the maximum number of points.
7. Information about the Course will be posted on the Department's website: <http://physiology.wum.edu.pl>
8. Students Research Scientific Group of Experimental Cardiology (contact: professor Marcin Ufnal, MD, PhD-mufnal@wum.edu.pl)

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ATTENTION

The final 10 minutes of the last class in the block/semester/year should be allocated to students'
Survey of Evaluation of Classes and Academic Teachers