





TOTAL per year: 65				
Educational objectives (max. 6 items)				
C1. Students should learn the basics of contemporary genetics, molecular biology and experimental methods used in genetics.				
C2. Students gain information about the influence of environmental pollution by mutagenic and carcinogenic substances on the human organism.				
C3. Students learn the fundamentals of medical parasitology, the structure and life cycles of human parasites and learn how to recognize the symptoms of parasitic infection.				
<b>Education result matrix for module/course in relation to verification methods of the intended education result and the type of class</b>				
Number of course education result	Number of major education result	Student who completes the module/course knows/is able to	Methods of verification of intended education results (forming and summarising)	Form of didactic class <i>**enter the abbreviation</i>
W 01	B.W.4	- describes structure and function of important chemical compounds (nucleic acids-DNA, RNA) present in the human organism - describes chromatin structure	written test or colloquium, written test exam	MC, L  MC
W 02	B.W.14	- define the basic terms used in genetics; list the genetic factors determining the human traits	written test or colloquium, written test exam	MC, SE, L
W 03	B.W.16	- knows the interactions in the parasite-host system	written test or colloquium,	MC
W 04	B.W.17	- has knowledge in the field of genetics and molecular biology (explain the basic processes involved in gene expression and its regulation; such as replication, transcription, translation; - explain the impact of environmental pollution by mutagenic and carcinogenic factors on human organism and to describe the phenotype effects of mutagenesis, chosen genetic diseases and mechanisms of their inheritance)	written test or colloquium, written test exam	MC, SE, L
W 05	B.W.18	- knows the clinical application of the principles of genetics	written test or colloquium, written test exam	SE, L
W 06	C.W.1	- knows the genera and species of parasites pathogenic to humans; describes the biology and morphology of human parasites ( <i>Protozoa, Platyhelminthes, and Nematelminthes</i> )	written test or colloquium	MC



W 07	C.W.3	- describes the epidemiology and prophylactics of parasitic infections	written test or colloquium	MC
W 08	C.W.6	- knows pathogenic agents (internal and external)	written test or colloquium	MC
W 09	C.W.16	- describes the basic methods used in the diagnosis of parasitic infections	written test or colloquium, written test exam	MC
U 01	B.U.4	- uses the biological and ecological terms to analyze the human-environment relations	written test or colloquium	MC
U 02	B.U.5	- uses the methods of genetics and molecular biology in disease diagnosis	written test or colloquium	MC, L
U 03	C.U.4	- recognizes morphological diagnostic characteristics of parasites, the basic symptoms of parasitic infections and uses the prophylactic methods	written test or colloquium; work with microscopes	MC
K 01		- student willingly broadens knowledge and skills - understands the need of learning, can inspire and organize the learning process of others	written test or colloquium, written test exam	SE, MC, L
K 02		- student cooperates in a group in order to solve problems - can take care of your own safety and that of people at your doorsteps	observation of a student during classes; work with microscopes	MC
K 03		- student searches for materials for classes and critically evaluates information sources	written test or colloquium, written test exam	SE, MC, L

\*\* L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning .

Please mark on scale 1-5 how the above effects place your classes in the following categories:

communication of knowledge, skills or forming attitudes:

Knowledge: 5

Skills: 3

Social competences: 1

**Student's amount of work (balance of ECTS points)**

Student's workload (class participation, activity, preparation, etc.)	Student Workload (h)
1. Contact hours:	40
2. Student's own work (self-study):	25
Total student's workload	65
ECTS points for module/course	6.0



Comments	
<b>Content of classes</b> (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)	
<b>Lectures:</b> (5 x 2 hours) Lecture 1. DNA, RNA, chromatin, chromosomes. Karyotype, organization of human genome, mitochondrial genome. Lecture 2. Replication of DNA in Eukaryotes. Transcription, translation. Regulation of gene expression in Eukaryotes. Lecture 3. DNA diversity, DNA mutations, mutagens, the influence of medicines, chemicals, physical factors, and environmental pollution. DNA repair mechanisms. Lecture 4. . Examples of genetic diseases including X-linked diseases. Lecture 5. Basic methods of molecular biology and their applications.	
<b>Practical classes:</b> (25 hours) Parasitology course contents: life cycles, geographical distribution, diagnosis and diagnostic features of the parasites' developmental forms, disease symptoms, pathogenicity, epidemiology, prevention of infection <ul style="list-style-type: none"><li>● Practical 1. (week 1; 2h) Organizational part - reading the internal regulations of the Biology Department; information about the Syllabus content and criteria for passing the subject. PARASITOLOGY: Protozoa – <u>Flagellates</u>: <i>Trichomonas vaginalis</i>, <i>Trichomonas tenax</i>, <i>Giardia intestinalis</i>, <i>Trypanosoma brucei gambiense</i>,</li><li>● Practical 2. (week 2; 2h) PARASITOLOGY: Protozoa – <u>Amoebae</u>: <i>Entamoeba histolytica/dispar</i>, <i>Entamoeba gingivalis</i>, and <u>Apicomplexans</u>: <i>Plasmodium</i> spp., <i>Toxoplasma gondii</i></li><li>● Practical 3. (week 3; 2h) Colloquium – protozoa. PARASITOLOGY – <u>Trematoda</u>: <i>Fasciola hepatica</i>, <i>Clonorchis sinensis</i>, <i>Schistosoma</i> spp.;</li><li>● Practical 4. (week 4; 2h) PARASITOLOGY – <u>Cestoda</u>: <i>Taenia saginata</i>, <i>Taenia solium</i>, <i>Hymenolepis nana</i>, <i>Echinococcus granulosus</i>, <i>Echinococcus multilocularis</i></li><li>● Practical 5. (week 5; 2h) PARASITOLOGY – <u>Nematoda</u>: <i>Ascaris lumbricoides hominis</i>, <i>Enterobius vermicularis</i>, <i>Trichuris trichiura</i>, <i>Trichinella spiralis</i></li><li>● Practical 6. (week 6; 3h) Colloquium – worms. TRANSMISSION GENETICS: Basic concepts and definitions of transmission genetics. Mendel's laws. Practical use of the laws of classical genetics in solving tasks related to mono- and dihybrid crosses. Codominance, multiple alleles; Gene cooperation e.g. epistasis, polygenes, complementary genes.</li><li>● Practical 7. (week 7; 2h) TRANSMISSION GENETICS: The cell's life cycle. The analysis of the stages of the animal cell division. Meiosis and gametogenesis (oogenesis and spermatogenesis).</li><li>● Practical 8. (week 8; 2h) TRANSMISSION GENETICS: Morgan theory of chromosomal inheritance. Practical solving of tasks related to linked genes. Sex determination. Baar body and Lyon hypothesis.</li><li>● Practical 9. (week 9; 3h) Colloquium – transmission genetics. MOLECULAR GENETICS: DNA and RNA structure. Chromatin structure and organization. DNA replication in Prokaryotes.</li></ul>	

<ul style="list-style-type: none"> <li>• <b>Practical 10.</b> (week 10; 3h) MOLECULAR GENETICS: The genetic code features and exceptions. Protein synthesis in living organisms (transcription and translation) with the factors and enzymes involved.</li> <li>• <b>Practical 11.</b> (week 11; 2h) MOLECULAR GENETICS: Gene expression regulation in Prokaryotes. Operon theory (lactose and tryptophan operon).</li> </ul>
<p><u>Seminars:</u> (5 hours)</p> <ul style="list-style-type: none"> <li>• <b>Seminar 1.</b> (week 12; 2h) Colloquium – molecular genetics. HUMAN GENETICS: Types and mechanism of mutation formation. The correct human karyotype. Chosen diseases caused by <b>numerical mutations</b>: Down syndrome, Edwards syndrome, Patau syndrome, Turner syndrome, Klinefelter syndrome; and chosen diseases caused by <b>structural mutations</b>: Wolf-Hirschhorn syndrome, Cri-du-chat syndrome, Prader-Willi syndrome, Angelman syndrome.</li> <li>• <b>Seminar 2.</b> (week 13; 2h) HUMAN GENETICS: Mechanisms of gene mutations. Chosen <b>autosomal inherited diseases – dominant</b>: Huntington's chorea, Alzheimer's syndrome, achondroplasia, Marfan syndrome, polydactyly, syndactyly; and <b>recessive</b>: phenylketonuria, alkaptonuria, albinism, cystic fibrosis, galactosemia, lipidosis hemoglobinopathies.</li> <li>• <b>Seminar 3.</b> (week 14; 1h) Colloquium – human genetics. Completion of the course.</li> </ul>
<p>Other -----</p>
<p><b>Basic literature</b> (list according to importance, no more than 3 items)</p> <ol style="list-style-type: none"> <li>1. A. Cisowska, A. Hendrich, M. Kicia, P. Leszczyński, M. Szydłowicz, D. Tichaczek-Goska, M. Wesółowska, D. Wojnicz "Medical Biology for students of Medicine and Dentistry of English Division", Wrocław Medical University, Wrocław 2019</li> <li>2. Klug WS, Cummings MR, Spencer ChA, Palladino MA, Concepts of genetics, Pearson Benjamin Cummings, 2009.</li> <li>3. B.J. Bogitsch, T.C. Cheng „Human parasitology“ 2<sup>nd</sup> edition, Academic Press 1998</li> </ol> <p><b>Additional literature and other materials</b> (no more than 3 items)</p> <ol style="list-style-type: none"> <li>1. Connor M., Ferguson-Smith M. "Essential medical genetics" Blackwell Science Ltd 1997</li> <li>2. R. Muller "Worms and human disease" Second edition, CABI Publishing 2002</li> <li>3. Campbell NA, Reece JB, Cain ML et al. Biology. A global approach. Pearson, 2016 (11<sup>th</sup> edition)</li> </ol>
<p><b>Didactic resources requirements</b> (e.g. laboratory, multimedia projector, other...)</p> <p>Classroom equipped with laptop, multimedia, microscopes. Lecture hall equipped with laptop and multimedia.</p>
<p><b>Preliminary conditions</b> (minimum requirements to be met by the student before starting the module/course)</p> <p>Knowledge of genetics at the high school level.</p>
<p><b>Conditions to receive credit for the course</b> (specify the form and conditions of receiving credit for classes included in the module/course, admission terms to final theoretical or practical examination, its form and requirements to be met by the student to pass it and criteria for specific grades)</p> <p>Passing 5 partial tests (transmission genetics, molecular genetics, human genetic diseases, protozoa, helminths) allows for getting credit and enter the final exam. <b>The attendance at all classes in accordance with the study regulations.</b> The percentage criteria for passing partial tests are identical to the examination criteria. A student who obtains an average of at least 4.75 from partial tests is exempted from the exam with a very good grade (5.0).</p>

In the absence resulting e.g. from illness, due to another important reason (justified by medical note or other official document), from the Rector's Day or Dean's Hours, the student is obliged to make up for the abandoned classes by preparing a presentation or an essay in an electronic version on the topic given by the teacher; or participating in classes with another group - if it is possible; after the acceptance of the teacher.

The exam is in the form of single choice test and covers the genetics (classes, seminars, and lectures). The final mark of the subject is the sum of points obtained during the exam (max. 80) and points obtained after converting grades from tests in parasitology during the semester (max. 20).

Grade:	Criteria for course
Very Good (5.0)	92-100%
Good Plus (4.5)	84-91%
Good (4.0)	76-83%
Satisfactory Plus (3.5)	68-75%
Satisfactory (3.0)	60-67%

  

Grade:	Criteria for exam
Very Good (5.0)	92-100%
Good Plus (4.5)	84-91%
Good (4.0)	76-83%
Satisfactory Plus (3.5)	68-75%
Satisfactory (3.0)	60-67%

**Name and address of module/course teaching unit, contact: telephone and e-mail address**

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List of persons conducting specific classes: full name, degree/scientific or professional title, discipline, performed profession, a form of classes.

LECTURES: Andrzej Hendrich, prof. dr hab., medical biology



SEMINARS: Dorota\_Wojnicz, dr hab., medical biology

PRACTICALS:

Przemysław Leszczyński, mgr, medical biology

Magdalena Szydłowicz, dr, medical biology

Dorota Tichaczek-Goska, dr, medical biology

Maria Wesółowska, dr, parasitology

**Date of Syllabus development**

27.06.2019

**Syllabus developed by**

Dr Dorota Tichaczek-Goska

**Signature of Head of teaching unit**

Uniwersytet Medyczny we Wrocławiu  
KATEDRA ZAKŁAD BIOLOGII  
I PARAZYTOLOGII LECARSKIEJ  
kierownik

Signature of Faculty Dean

prof. dr hab. Andrzej Hendrich