


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
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 Społecznego

UNIA EUROPEJSKA
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Course title		ECTS code	
Molecular Diagnostics of Microorganisms		not defined	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	second tier studies (MA)
Faculty of Biology	Biology	form	full-time
		specialty	all
		specialization	all
Teaching staff			
dr inż. Karolina Stojowska-Swędryńska; dr hab. Wojciech Pokora, profesor uczelni			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		2	
Lecture		ESTIMATION OF WORKING TIME:	
The realization of activities		a) Classes requiring direct participation of the academic teacher and student:	
classroom instruction		- participation in lectures: 15 h	
Number of hours		- participation in the written colloquium: 1 h	
Lecture: 15 hours		- participation in consultations: 9 h	
		b) Student's own work:	
		- preparation for discussion and problem solving: 10 h	
		- preparation for written colloquium, final assessment: 15 h.	
		TOTAL: 50 hours.	
The academic cycle			
2022/2023 summer semester			
Type of course		Language of instruction	
an elective course		english	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
		Final evaluation	
		Graded credit	
		Assessment methods	
		- written colloquium: test questions and open-ended tasks (problem solving)	
		- (mid-term / end-term) test	
		The basic criteria for evaluation	
		written colloquium comprises questions on lecture material and additional readings specified during the lecture series – minimum 51% of points from the final written test	
Method of verifying required learning outcomes			
Required courses and introductory requirements			
A. Formal requirements			
Molecular biology, Biochemistry, Microbiology			

B. Prerequisites Knowledge of the structure, properties and functions of basic biological macromolecules (including DNA, RNA, restriction enzymes, DNA polymerases), knowledge of basic techniques of molecular biology and genetic engineering (including PCR, electrophoresis), basic knowledge of the structure and biochemistry of microorganisms	
Aims of education The aim of the lecture is to present the possibilities and limitations of using molecular diagnostics in various aspects of microbiological research	
Course contents Application of molecular diagnostics in medicine, microbiology and biotechnology. Standardization of diagnostic methods and verification of molecular tests. Conducting diagnostic tests, controls, the problem of contamination, false positive and false negative results Genetic material for diagnostic tests (source, isolation methods) Genetic polymorphism and regions conserved evolutionarily. Detection and species specific identification of microorganisms Detection of virulence and antibiotic resistance genes Genetic typing methods of microorganisms (DNA fingerprinting, e.g. Restriction Enzyme Analysis Pulsed-field Gel Electrophoresis, Ligation Mediated PCR, Restriction Fragment Length Polymorphism, Variable Number Tandem Repeat, Ribotyping) Application of molecular typing methods in epidemiology.	
Bibliography of literature A. Literature required to pass the course Scientific articles (handed out during course) Persing, Tenover, Hayden, Molecular Microbiology, American Society for Microbiology, 2016 Elizabeth van Pelt-Verkuil, Molecular Diagnostics, Springer-Verlag GmbH, 2019 Vira, Bhat, Chavan, Diagnostic molecular microbiology and its applications: Current and future perspectives, Clin Microbiol Infect Dis, 2016, doi: 10.15761/CMID.1000105 B. Extracurricular readings Latest scientific articles (pointed during the course)	
The learning outcomes (for the field of study and specialization) Przedmiot realizuje efekty dla kierunku Biologia: B2_W03, B2_W08, B2_U01, B2_U3, B2_K05, B2_K07	Knowledge B2_W03: The graduate has an in-depth knowledge and understanding of research problems related to molecular diagnostics of microorganisms that require the use of advanced tools B2_W08: The graduate has an in-depth knowledge and understanding of the wealth of modern experimental approaches and techniques used in the molecular diagnostics of microorganisms and their use to solve the assigned tasks
	Skills B2_U01: The graduate is able to select and use techniques and research tools adequate to the problems related to molecular diagnostics of microorganisms B2_U3: The graduate is able to make a critical analysis and selection of information in the field of molecular diagnostics of microorganisms, especially from electronic sources
	Social competence B2_K05: The graduate is ready to use recognized sources of scientific and popular science information on molecular diagnostics of microorganisms in order to broaden their knowledge B2_K07: The graduate is ready to systematically update biological knowledge in the field of molecular diagnostics of microorganisms and information about its practical applications
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