


KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
Unię Europejską w ramach
Europejskiego Funduszu
Społecznego

UNIA EUROPEJSKA
EUROPEJSKI
FUNDUSZ SPOŁECZNY


Course title		ECTS code	
Molecular Diagnostics of Microorganisms		13.1.1618	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	drugiego stopnia
Wydział Biologii	Biologia	form	stacjonarne
		specjalty	wszystkie
		specialization	wszystkie
Teaching staff			
dr inż. Karolina Stojowska-Swędryńska			
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 winter semester			
Type of course	Language of instruction		
an elective course	english		
Teaching methods	Form and method of assessment and basic criteria for eveluation 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			

zakładany efekt kształcenia	Conversational lecture with multimedia presentation, problem solving
	Wiedza
B2_W03	written colloquium/discussion
B2_W08	written colloquium/discussion
	Umiejętności
B2_U01	written colloquium/discussion
B2_U03	written colloquium/discussion
	Kompetencje
B2_K05	discussion
B2_K07	discussion

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
	<p>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</p> <p>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</p>
Contact	
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