Attachment No. 5 to Rector's ordinance No. 22/2020

DESCRIPTION OF THE COURSE OF STUDY

Course code	0512-2BIOT-C14-MO	
Name of the course in	Polish	**Mikrobiologia ogólna**
	English	**General microbiology**

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	**Biotechnology**
1.2. Mode of study	**Full-time studies**
1.3. Level of study	**First-cycle studies**
1.4. Profile of study*	**General academic**
1.5. Person/s preparing the course description	**dr Grzegorz Czerwonka**
1.6. Contact	**gczewonka@ujk.edu.pl**

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	**English**
2.2. Prerequisites*	**-**

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		Lectures, laboratory exerices
3.2. Place of classes		Classes in the teaching room of the UJK
3.3. Form of assessment		Lecture - exam, laboratory exercises - credit with grade
3.4. Teaching methods		Lecture, discussion, demonstration, independent experiments, project
3.5. Bibliography	**Required reading**	Essential Microbiology, Stuart Hogg, September 2005, ISBN: 0 471 49754 1, John Wiley & Sons Inc.,
	Further reading	Merck Microbiology Manual 12th Edition, online

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives ***(including form of classes)***

Lectures

C1. Basic knowledge of the cell structure of microorganisms, biochemistry, physiology, including pathogenic factors.

C2. Awareness of the application of the principles of safe work with microorganisms.

Classes

C1. Practical application of knowledge in the field of biochemical and physiological properties of bacteria in their identification by cultivation methods.

C2. The ability to assess the risks of laboratory work on microbiological material.

4.2. Detailed syllabus ***(including form of classes)***

Lectures

1. ***History of discoveries in the field of microbiology and definitions of terms: microbiology, microorganism, cultivation, microbiological media, clone, strain.***
2. ***Classification of microbiological sciences.***
3. ***Methods of sterilization and preparation of microbiological media.***
4. ***Growth of bacteria, isolation and cultivation of microorganisms.***
5. ***Techniques of preparation of microscopic slides.***
6. ***Bacterial cell wall. Structure and function of capsule, bacterial flagella, fimbriae.***
7. ***Bacterial nucleoid and mobile genetic elements.***
8. ***Structure and classification of bacteriophages. Lytic and lysogenic cycle of bacteriophages.***
9. ***Energy metabolism.***
10. ***Pathogenicity of bacteria.***
11. ***Bacteriocins and interactions between microorganisms.***
12. ***Mechanism of action of antibiotics.***

Classes

1. ***Health and safety regulations in the microbiological laboratory. Methods of sterilization and disinfection, microbiological media.***
2. ***Bacteriological culture methods.***
3. ***Macroscopic morphology. Microscope Slides Preparation - Styles and Techniques. Staining of slides (part one).***
4. ***The cell wall of microorganisms. Staining of slides (part two).***

5. *Biochemical properties of bacteria.*
6. *Bacterial energy metabolism.*
7. *Factors of bacterial virulence.*
8. *Determination of antimicrobial susceptibility.*

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		
W01	Student explains the scope of research topics of microbiology	BIOT1A_W04
W02	Student explains the role of the elements of the cellular structure of bacteria	BIOT1A_W02
W03	Student explains the strategies for obtaining energy by bacteria	BIOT1A_W04
W04	Student describes the mechanisms of bacterial resistance to selected antibiotics	BIOT1A_W03
W05	Student analyzes the mechanisms of pathogenesis	BIOT1A_W02
within the scope of **ABILITIES:**		
U01	Student applies the principles of safe work with bacteria	BIOT1A_U01
U02	Student determines the effect of antibiotics on bacteria	BIOT1A_U06
U03	Student determines the morphological forms of bacteria on the basis of staining and microscopic observation	BIOT1A_U05
U04	Student determines the basic biochemical properties of bacteria	BIOT1A_U06
within the scope of **SOCIAL COMPETENCE:**		
K01	Student is aware importance of the application of the principles of safe work with microbiological material	BIOT1A_K02
K02	Student is prepared to work actively in groups and able to communicate with people who are and are not specialists in a given field	BIOT1A_K03

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes *(code)*	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*		
	L	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...
W01	+				+																
W02	+				+																
W03	+																				
W04	+																				
W05	+																				
U01											+										
U02											+										
U03											+										
U04											+										
K01											+						+				
K02																	+				

delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lectures	3	Exam - test, 51-60% correct answers
	3,5	Exam - test, 61-70% correct answers

	4	Exam - test, 71-80%correct answers
	4,5	Exam - test, 81-90%correct answers
	5	Exam - test, 91-100% correct answers
classes (C)*	**3**	Credit with grade - test, 51-60% correct answers
	3,5	Credit with grade - test, 61-70% correct answers
	4	Credit with grade - test, 71-80% correct answers
	4,5	Credit with grade - test, 81-90% correct answers
	5	Credit with grade - test, 91-100% correct answers

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	**Student's workload**	
	Full-time studies	**Extramural studies**
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	**75**	
*Participation in lectures**	34	
*Participation in classes, seminars, laboratories**	40	
*Preparation in the exam/ final test**	1	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	**75**	
*Preparation for the lecture**	5	
*Preparation for the classes, seminars, laboratories**	35	
*Preparation for the exam/test**	35	
TOTAL NUMBER OF HOURS	**150**	
ECTS credits for the course of study	**6**	

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Accepted for execution *(date and legible signatures of the teachers running the course in the given academic year)*

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