

FACULTY OF CHEMISTRY					
SUBJECT CARD					
Name in English		Microbiology II			
Main field of study (if applicable)		Biotechnology			
Specialization (if applicable)					
Profile:		academic			
Level and form of studies:		1 st level/ full-time			
Kind of subject		obligatory			
Subject code		BLC013006			
Group of courses		NO			
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)			45		
Number of hours of total student workload (CNPS)			60		
Form of crediting			crediting with grade		
For group of courses mark (X) final course					
Number of ECTS points			2		
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BK) classes			1,5		
PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES					
1. Higher school level of biology. 2. Microbiology fundamentals					
SUBJECT OBJECTIVES					
C1	To provide students with the knowledge about the bacterial genetics.				
C2	To provide students with the knowledge about the bacterial metabolisms.				
C3	Students is able to define and examine the physical-chemical factors influencing bacterial metabolism.				
C4	Students is able to plan and perform the experiments with the microbes - individually.				
SUBJECT LEARNING OUTCOMES					
related to skills:					
PEK_U01 - Students is able to evaluate the influence of physical and chemical factors on the bacterial growth					
PEK_U02 – Students is able to plan and make the experiments form the area of general microbiology					
PROGRAMME CONTENT					
Form of classes - laboratory					Number of hours
Lab 1	Rules of lab credits. Rules of safety and work in microbial lab.				3
Lab 2	Nutrition requirements of bacteria I. Inoculation of bacteria on minimal and complete media – intensity of growth observation and comparison of different bacterial colonies. Inoculation of chosen bacterial strains on media with different nitrogen and carbon sources. Growth observations – optimal composition of cultivation media for particular bacterial strains.				3

Lab 3	Nutrition requirements of bacteria II. Inoculation of bacteria on minimal and complete media – intensity of growth observation and comparison of different bacterial colonies. Inoculation of chosen bacterial strains on media with different nitrogen and carbon sources. Growth observations – optimal composition of cultivation media for particular bacterial strains.	3
Lab 4	The influence of physic factors on bacterial growth I. Optimal temperature of growth of chosen bacterial strains. Thermal lethal point assignment; influence of drying on the bacterial growth.	3
Lab 5	The influence of physic factors on bacterial growth II. Thermal lethal time assignment for chosen strains. The influence of UV radiation on the bacterial strains growth.	3
Lab 6	The influence of chemical factors on bacterial growth. Optimal pH of growth assignment for chosen strains. The influence of disinfectants on the growth of chosen strains.	3
Lab 7	Fundamentals of bacterial diagnostics – Gram staining.	3
Lab 8	Antibiotics resistant I: Applied methods of evaluation.	3
Lab 9	Antibiotics resistant II: application of chosen drugs.	3
Lab 10	Bacterial metabolism I: sugars fermentation.	3
Lab 11	Bacterial metabolism II: nitrogen metabolism, assessment of the activity of the exogenous bacterial enzymes.	3
Lab 12	Fundamentals of yeasts cultivation and viability evaluation.	3
Lab 13	Checking the results of previous experiments. Lab for students with absences, allowing completing the missing subjects.	3
Lab 14	Credit – first attempt. Experimental and theoretical part.	3
Lab 15	Credit – second attempt. Experimental and theoretical part.	3
	Total hours	45

TEACHING TOOLS USED

N1	Multimedia presentation
N2	Individual laboratory work

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation F – forming (during semester), P – concluding (at semester end)	Learning outcomes number	Way of evaluating learning outcomes achievement
P (laboratory)	PEK_U01 – U02PEK_U02	Final test

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] P. Ketchum et all „Microbiology – Concepts and applications”
- [2] Michael T. Madigan et all “Biology of Microorganisms”
- [3] „Mikrobiologia” ; H.G. Schlegel

SECONDARY LITERATURE:

- [1] „Życie bakterii” W. Kunicki-Goldfinger,
- [2] „Bakterie w biologii, biotechnologii i medycynie” P. Singleton,

SUBJECT SUPERVISOR

(NAME AND SURNAME, E-MAIL ADDRESS)

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