

FACULTY OF CHEMISTRY					
SUBJECT CARD					
Name of subject in English		Microbiology I			
Main field of study (if applicable)		Biotechnology			
Specialization (if applicable)					
Profile		academic			
Level and form of studies:		1 <sup>st</sup> level/ full-time			
Kind of subject		obligatory			
Subject code		BLC013007			
Group of courses		NO			
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)			30		
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		
*PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES					
1. Higher school level of biology.					
SUBJECT OBJECTIVES					
C1	To provide students with a basic definitions and vocabulary essential for microbiology				
C2	To provide students with knowledge about morphology, physiology and systematics of bacteria.				
C3	To provide students with knowledge about work in the microbiological labs.				
C4	To provide students with knowledge about planning and performing the experiments with the microbes.				
SUBJECT LEARNING OUTCOMES					
<b>related to skills:</b>					
PEK_U01 – Student knows the microbial lab equipment, knows the basics rules of the work with microbes, is able to use proper tools for correct purposes.					
PEK_U02 – Student is able to work under sterile conditions and knows the cultivation and nutrient requirements of the bacteria					
PEK_U03 – Student knows the microscopic methods allowing to preliminary biochemically characterize the microbes					
PEK_U04 – Student is able to plan and make the experiments from 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. Principles of operation of lab equipment and location of the particular tools (Koch				2+2
Lab 2					

	apparatus, autoclave, dryers and shakers. Description of basic microbiological tools, Petri dishes, inoculation loops, spreaders, pipets and tubs.	
Lab 3 Lab 4	Teaching of sterile work with bacteria. Sterile passing of bacteria from liquid into solid media and vice versa.	2+2
Lab 5 Lab 6	Solid media preparations: plates and slants. Technics of the loop and spreader applications to culture bacteria on different media (spreading bacterial lawn, streak culture) .	2+2
Lab 7 Lab 8	Pure cultures isolation. Different isolation technics: with inoculating loop or spreader – solid media cultivation.	2+2
Lab 9 Lab 10	Bacterial growth curve – cells counting. Evaluation of a bacterial cells number by different methods: dilution series or spectrophotometry.	2+2
Lab 11 Lab 12	Different growth and cultivation types. Cultivation of chosen bacterial strains on liquid media with the surfactant adds (Tween 80). Comparison of the bacterial growth lawn on and inside the solid media – colony morphology.	2+2
Lab 13 Lab 14	Morphology of bacterial cells. Different types of bacteria staining. Simple staining – microscopic observation of prepared samples. Simple staining – microscopic observation of prepared samples. Complex staining – Gram staining – microscopic observation of G(+) and G(-) bacteria.	2+2
Lab 15	Credit – first attempt. Experimental and theoretical part.	2
	Total hours	<b>30</b>
<b>TEACHING TOOLS USED</b>		
N1	Multimedia presentation	
N2	Individual laboratory work	
<b>EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT</b>		
<b>Evaluation</b> F – forming (during semester), P – concluding (at semester end)	Learning outcomes number	Way of evaluating learning outcomes achievement
P (laboratory)	PEK_U01 – PEK_U04	Colloquium – final test
<b>PRIMARY AND SECONDARY LITERATURE</b>		
<b><u>PRIMARY LITERATURE:</u></b>		
[1] P. Ketchum et all „Microbiology – Concepts and applications”		
[2] Michael T. Madigan et all “Biology of Microorganisms”		
[3] „Mikrobiologia” ; H.G. Schlegel		
<b><u>SECONDARY LITERATURE:</u></b>		
[1] „Życie bakterii” W. Kunicki-Goldfinger,		
[2] „Bakterie w biologii, biotechnologii i medycynie” P. Singleton,		
<b>SUBJECT SUPERVISOR</b> (NAME AND SURNAME, E-MAIL ADDRESS)		
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