

COURSE DESCRIPTION (SYLLABUS)

1.	Course: Molecular Organization of Bacterial Cell
2.	Language of instruction: English
3.	Faculty: Faculty of Biotechnology
4.	Course/module code: 29-BT-S2-E1-EngMobl
5.	Course/module type (<i>mandatory or elective</i>): mandatory
6.	Programme: Medical Biotechnology
7.	Study cycle: 2nd cycle
8.	Year: 1st
9.	Semester (<i>autumn or spring</i>): Autumn
10.	Form of tuition and number of hours: Laboratory, 30 h
11.	Name, Surname, academic title: Marcin Szafran, PhD
12.	Initial requirements (knowledge, skills, social competences) regarding the course/module and its completion Students should: <ul style="list-style-type: none"> • have basic knowledge in microbiology, biochemistry and molecular biology; • be familiar with the principles of health and safety as well as follows the procedures of working with genetically modified organisms (GMO).
13.	Objectives: Knowledge about advanced techniques commonly used in microbiology and molecular microbiology, including biophysical approaches and bioinformatics tools. Analysis of collected data, their interpretation and graphical presentation.
14.	Content: Practical course of broadly used microbiology techniques (laboratory growth of microorganisms, genetic transformation, clone selection and verification using PCR). Methods of growth rate analysis of bacterial cultures under standard conditions and after exposure to antibiotics, calculation of growth parameters, including growth rate and MIC values. Fluorescent microscopy as a tool for molecular microbiology studies, data collection

	<p>and their subsequent analysis using dedicated bioinformatics software.</p> <p>Learning of experimental data analysis and their presentation.</p>	
15.	<p>Learning outcomes:</p> <p>Students:</p> <ul style="list-style-type: none"> • provide qualitative and quantitative descriptions of complex microbiological processes; • consistently apply and disseminate the principle of strict interpretation of microbiological processes in research based on empirical data; • possess advanced knowledge of biological sciences, including bioinformatics, molecular biology and microbiology; • possess knowledge of the current issues prevailing in scientific literature ; • have the ability to plan research in genetic engineering, molecular and structural biology as well as microbiology; • apply advanced technology and research tools in biological sciences including, microbiology and molecular biology; • efficiently make use of scientific literature in the field of molecular microbiology, read professional literature in English; • show ability in critically analyzing and selecting information, especially from electronic resources; • plan and perform research tasks and analysis under the supervision of a tutor; • use statistical methods, computer tools ant technology to describe biological processes; • collect and interpret experimental data, synthesize it and make appropriate; • collaborate and work as a part of a team in order to plan research and solve problems; • prioritize in order to carry out specific research projects. 	<p>Outcome symbols:</p> <p>K_W01, K_W02, K_W03, K_W05, K_W07</p> <p>K_U01, K_U02, K_U03</p> <p>K_U04, K_U05, K_U06</p> <p>K_K02, K_K03</p>
16.	<p>Recommended literature:</p> <ul style="list-style-type: none"> • Joan L. Slonczewski and John W. Foster „<i>Microbiology. An evolving science</i>”; • Michael T. Madigan, John M. Martinko, Kelly S. Bender, Daniel H. Buckley, David A. Stahl, Thomas Brock “<i>Brock Biology of Microorganisms</i>”; • Laboratory protocol provided by the tutor. 	
17.	<p>Methods of verification of the assumed learning outcomes:</p> <ul style="list-style-type: none"> • the final test in writing • reports after each laboratory module 	
18.	<p>Conditions of earning credits:</p>	

	<ul style="list-style-type: none"> • attendance at classes • reports • the final test in writing 	
19.	Student's workload:	
	Activity	Number of hours for the activity
	Hours of instruction (as stipulated in study programme): laboratory	30 h
	Student's own work: <ul style="list-style-type: none"> • preparation before classes • reading literature • writing course reports • preparing for the final test 	5 hours 5 hours 10 hours 10 hours
	Total number of hours:	60 h
	Number of ECTS:	2 ECTS