

Module name	Microbiology
Module code	B-BM.070Eng
ISCED code	0511: Biology
Study cycle	I ^o
Semester	winter
Responsible for this module	dr hab. Iwona Komaniecka Department of Genetics and Microbiology email: iwona.komaniecka@poczta.umcs.lublin.pl
Language of instruction	English
Website	-
Prerequisites	Basic knowledge of structure and functions of living organisms and basic biochemistry
ECTS	5.0
ECTS points hour equivalents	Contact hours (work with an academic teacher) – 60 - lectures: 30 - laboratories: 30 Non-contact hours (students' own work) – 60 - preparation for the exam: 25 h - preparation for labs: 20 h - preparation of reports from laboratory exercises: 5 h - literature study: 10 h Total number of ECTS points for the module – 5.00
Learning outcomes verification methods	presence (90 %) and activity at laboratories, written tests at laboratories (3 partial tests in semester), presence at lectures (min. 50 %) final test written at the end of lectures
Course full description	Lectures: Introduction to microbiology. History of microbiology. Evolution of life on the Earth. Prokaryotic and eukaryotic microorganisms. Structure and functions of prokaryotic cell. Microbial growth and development. Effect of physical and chemical factors on microbial growth. Antibiotics. Microorganisms nutrition: carbon, nitrogen, hydrogen, oxygen, phosphate, sulphur. Microbial metabolism: oxygenic and anoxygenic respiration, fermentation, photosynthesis, chemosynthesis. Interactions between microorganisms and other organisms in the environment. Introduction into medical microbiology. Characteristics of bacteriophages: their structure and reproduction. Laboratories: 1. Introduction into microbiological work. Safety rules. Introduction into microscopic observations. 2. Microbial morphology: Gram-staining. 3. Microbial morphology: acid-fast staining method, methods for endospore staining. 4. Techniques of microbiological work: titration of bacteria. Isolation of bacterial clean cultures. 5. Techniques of microbiological work: macroscopic and microscopic description of bacterial clean cultures. 6. Media for bacterial cultures. Procedures of sterilization and disinfection.

	<p>7. Effect of physical and chemical factors on microbial growth.</p> <p>8. Microbial metabolism – oxygenic and anoxygenic respiration, fermentation.</p>
Bibliography	<p>1. Microbiology Principles and Explorations. J.G. Black 8th edition.</p> <p>2. Prescott's Microbiology, Willey Sherwood Woolverton, 7th and 8th edition.</p>
Learning outcomes	<p>KNOWLEDGE The graduate has knowledge on and understands basic concepts used in the microbiology, knows the facts concerning development of Life on the Earth, involved with the prokaryotic cell structure and functioning, is able to characterize chosen groups of microorganisms. The graduate knows and understands methods and techniques used in microbiological research. The graduate knows and understands the importance of microorganisms for environment and humans.</p> <p>SKILLS The graduate based on his/her knowledge is able to select data resources properly, to solve problems and perform assigned tasks in the frame of microbiology subject. The graduate is able to select properly and apply appropriate research methods and tools necessary to perform experiments concerning the analysis of microbiological material. The graduate is able to properly plan and carry out experiments in microbiology subject, and to interpret study results and formulate conclusions based on acquired data. The graduate is able to communicate with the milieu using terminology from the microbiology area. The graduate is able to design and implement lifelong learning by choosing the range of study problems consistent with his/her interests and future occupational and/or scientific activities.</p> <p>SOCIAL COMPETENCES The graduate is ready to respect and disseminate patterns of proper conduct inside and outside the work milieu, make independent decisions, assess critically own activities as well as the activities of teams and organizations to which he/she belongs, and take responsibility for the effects of these activities. The graduate is ready to assess his/her knowledge and acquired information critically, recognize the importance of general and specialist knowledge in the field of microbiology in solving theoretical and practical problems. The graduate is ready to sharing biological knowledge with others. The graduate is ready to comply with the principles of professional ethics and require such compliance from other team members.</p>
Practice	-
Teaching methods	lecture with presentation;

	laboratory classes: experience, observations, discussion
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