NAME OF THE COURSE		BASICS IN MICROBIOLOGY					
Code	PMB280	Year of study		2			
Course teacher	Associate Professor Ana Maravić, PhD	Credits (ECTS)		3			
Associate teachers	Tomislav Rončević, PhD	Type of instruction (number of hours)		L	S	E	F
				15		15	
Status of the course	Mandatory	Percentage of application of e-learning					
COURSE DESCRIPTION							
Course objectives	Understanding the basic knowledge of microbiology including physiology, morphology, genetics, ecology and pathogenicity of microorganisms; use of laboratory methods and techniques in microbiological research and development of knowledge in the field of microbiology.						
Course enrolment requirements and entry competences required for the course	Cell biology						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Students will be able to: 1. explain the structure, diversity and replication process in different groups of microorganisms. 2. explain the genetic mechanisms of adaptation of prokaryotic microorganisms in different environmental conditions. 3. apply physiological and biochemical tests for the identification of microorganisms 4. identify mechanisms of pathogenicity of microorganisms that cause diseases in humans and animals as well as the mechanisms used by the hosts to defend themselves against pathogens 5. determine the number of microorganisms in the sample and calculate the growth of microorganisms in a variety of patterns and in controlled laboratory conditions						
Course content broken down in detail by weekly class schedule (syllabus)	Lectures: 1. History of microbiology. (1 hour) 2. Distribution of microorganisms and their role in biogeochemical processes in nature. (1 hour) 3. Eukaryotes, Archaea and Bacteria; structure and function. The morphology, nomenclature and classification of microorganisms. (1 hour) 4. The basic structure and function of prokaryotic cells. (1 hour) 5. Genetics of microorganisms, genome organization, mobile genetic elements. (1 hour) 6. Growth of microorganisms and basic factors of growth; nutrients, temperature, oxygen, pH and osmotic pressure. (1 hour) 7. Metabolic activity of microorganisms. Identification of microorganisms using various physiological and biochemical tests. (1 hour) 8. Microorganisms and diseases; resistance, the ratio of a micro and the host immune responses to infection. (1 hour) 9. Mechanism of antimicrobial resistance to antibiotics and other chemical substances. (1 hour) 10. The basic morphological characteristics and pathogenicity of fungi, yeasts and moulds. Diseases caused by fungi and did their toxins. (1 hour) 11. The application of microorganisms in biotechnology. (1 hour) 12. Basic morphological characteristics and development cycles of parasites. (1 hour) 13. Role of microorganisms in the biodegradation of heavy metals, nitrates and chlorinated hydrocarbons. (1 hour) 14. Basic morphological characteristics of the virus, viroid and prions. Classification, nomenclature of viruses. (1 hour) 15. Control of microbial growth by physical and chemical methods. (1 hour)						

	Laboratory exercises include : Techniques in aseptic conditions, procedures for preparing and simple and complex methods of colouring preparations. Isolation of pure cultures of microorganisms, preparation of culture media, culture and the use of different methods of isolation and identification of bacteria. Identification of microorganisms using various physiological and biochemical tests. Basic macro and micro morphological features and yeasts and moulds. Cultivation of yeasts and moulds on nutrient media, isolation and identification. The basic morphological characteristics of the parasites. Sample preparation for the identification of the parasite. Mechanisms of antimicrobial resistance of bacteria to antibiotics and other chemicals, and the determination of the sensitivity of microorganisms to antibiotics. Methods for determining the number of bacteria in different samples of food and water dilution method, the spectrophotometric method and membrane filtration.
Format of instruction	☒ lectures ☐ seminars and workshops ☒ exercises ☐ *on line* in entirety ☐ partial e-learning ☐ field work ☐ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☐ (other)
Student responsibilities	Regular attendance of all forms of teaching, active participation in class, written reports of experimental work.

Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Class attendance	1.0	Research		Practical training	
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	2.0	Project		(Other)	

Grading and evaluating student work in class and at the final exam	The final grade students will be based on the results achieved, including lectures and laboratory exercises.Evaluating student work will be based on a percentage of the resulting total number of points according to this scale: < 60% insufficient; 60-69% sufficient (2), 70-79% solid (3), 80-89% very good (4), 90-100% excellent (5).

Required literature (available in the library and via other media)	Title	Number of copies in the library	Availability via other media
	Talaro, K.P., Talaro, A. Foundations in Microbiology: Basic Principles, 5th Edition, USA, 2005.	1	

Optional literature (at the time of submission of study programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	Taking attendance in class; the annual analysis of the performance of the examination; Student survey in order to evaluate teachers; self-evaluation of teachers. Feedback from students who have already graduated from the relevance of the course content.
Other (as the proposer wishes to add)	