

Course Title: MICROBIAL ECOLOGY			
Course status: obligatory			
ECTS: 7			
Requirements: none			
Learning objectives: The course objective is to provide a framework for understanding the relationship between microorganisms and their role in biogeochemical cycling in natural communities.			
Learning outcomes: Students should be able to: Relate metabolic reactions carried out by microbes to global biogeochemical cycling of elements: understand these reactions in terms of chemistry, microbial physiology, and the importance in the environment. Understand the mechanisms how abiotic factors can influence on the microbial growth and microbial cells and how we can use these knowledge for controlling the growth of microorganisms. Understand the factors that regulate interactions between microbes. Understand the importance of these interactions in structuring microbial communities. Understand how the specific environmental properties of soils, oceans and biofilms affect microbial communities therein. Understand relations between microorganisms and plants, animals and man. Relate general principles of microbial ecology to role of microbes in disease. Describe the distribution and role of microorganisms in different habitats such us atmosphere, water ecosystems and soil. Describe how microbes are useful in biotechnological and environmental applications such as sewage treatment, bioremediation, etc. Relate the physiology of microbes to their role in these processes.			
Syllabus: <i>Theoretical part</i> The definition of microniche and the term of biogeosphere through biogeochemical cycles of carbon, nitrogen, sulfur, phosphorus and some metals (Fe, Mn, and Hg in particular). The concept of ecological valence and the relationship of microorganisms to abiotic and biotic environmental factors. Distribution and importance of microorganisms in the atmosphere, hydrosphere and pedosphere. Environmental factors in controlling microorganisms and basic principles of application of ecological principles in biotechnology. <i>Practical part</i> Sampling and isolation of different group of microorganisms from different environments. Formation and analysis of microbes in Winogradsky column. Examination of the representation of different physiological groups of microorganisms in water and soil. The influence of environmental factors on the growth of microorganisms isolated from diverse habitats.			
Total hours:			
Lectures: 3	Practicals: 3	Other: -	Student research work: -