

Course Unit Descriptor

Study Programme: Environmental Engineering			
Course Unit Title: Physical and Chemical Principles			
Course Unit Code: Z507			
Name of Lecturer(s): Maja Turk-Sekulić			
Type and Level of Studies: Master level			
Course Status (compulsory/elective): compulsory			
Semester (winter/summer): winter			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): face-to-face			
Number of ECTS Allocated: 4			
Prerequisites: None			
Course Aims: Education and training of professionals to work independently in the fields of natural sciences, with special emphasis on physicalchemical research in the field of Environmental Engineering and the active use of modern experimental, numerical and physicalchemical methods, developing capacity for constant expansion, searching for new knowledge in the complex interdisciplinary field of Environmental Engineering.			
Learning Outcomes: Outcome of the course: 1. General skills: Independent observation, formulation and problem solving using modern experimental, theoretical and numerical methods. Training for the purpose of organizing and performing team research, treatment of results according to scientific principles, making optimal and realistic conclusions. The capability to search relevant literature and other forms of information; 2. Course-specific skills: Special affiliation to natural sciences from the physical-chemical field.			
Syllabus: Introduction: Chemical thermodynamics and kinetics. The complex interactions between land, water, air and biosphere. Definition of the concept of biophysical surface. Warming of land, water and air. Precipitation and dissolution. Physicochemical processes at interfaces. Interaction between solid and liquid phases, solid and gaseous and liquid and gaseous. Basic concepts contamination of the biosphere and the processes of physical-chemical treatment. New materials, nanotechnology and nanomolecules. Molecular interactions. Supra-molecular chemistry and supramolecules. Speed and kinetics of complex reactions. Basic principles of colloid system. Physicochemical processes in the function of Environmental Engineering.			
Required Reading: Relevant literature in English, tbd			
Weekly Contact Hours: 5	Lectures: 3	Practical work: 2	
Teaching Methods: The classes will be realized in the form of lectures, seminars and homework and partial examinations - conversations with students.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points

Group Assignment		Examination Assignment	
Exercises			
Test			
Test			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.