

Study Programme: Chemistry, Biochemistry			
Course Unit Title: Calculation in Chemistry			
Course Unit Code: H-101			
Name of Lecturer(s): Full professor Slobodan Gadžurić			
Type and Level of Studies: Bachelor Academic Studies			
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: 5			
Prerequisites: None			
Course Aims:			
<ul style="list-style-type: none"> • Providing wide and balanced theoretical knowledge on key concepts of calculations in chemistry. • Enabling students to apply standard methodology in solving calculation problems in chemistry. • Providing the knowledge basis of fundamental chemical calculation for successful processing of knowledge in further chemical education. 			
Learning Outcomes:			
<ul style="list-style-type: none"> • Demonstrate developed ability of abstract thinking on chemical calculation problems based on understanding of the fundamental chemical terms and definitions. • Demonstrate knowledge and understanding of basic concepts, terms and principles of homogenous and heterogeneous equilibria in water solutions. • Practically apply theoretical knowledge and understanding in solving qualitative and quantitative problems. • Recognize and solve chemical problems in familiar context and apply the acquired knowledge to other disciplines. 			
Syllabus:			
<i>Theory</i>			
Solutions. Mass fraction, concentrations, molality. Dilution and mixing of two solutions. Equilibria in water solutions: strong and weak electrolytes. Calculation of pH of strong acids and bases, weak acids and bases, polyprotic acids, buffers and ampholytes. Heterogeneous equilibria: solubility product, solubility. Precipitation. Influence of common ion. Quantitative and fractional precipitation.			
<i>Practical instructions</i>			
Calculation of concentrations, pH in different solutions, and problems based on heterogeneous equilibria in water solutions.			
Required Reading:			
Weekly teaching load			
Weekly Contact Hours: 60	Lectures: 30	Practical work: 30	
Teaching Methods:			
Lectures and practical instructions			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Test I	20	Written exam	(100)
Test II and Test III	80		