

Course Unit Descriptor

Study Programme: Veterinary medicine			
Course Unit Title: Medicinal Chemistry			
Course Unit Code: 3IVM1003			
Name of Lecturer(s): Prof. Boris Popović, Ass. Prof. Ružica Ždero Pavlović, Assistant MSc Bojana Blagojević			
Type and Level of Studies: Integrated 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: 4			
Prerequisites: None			
Course Aims: Providing the basis for a certain view of the world, getting to know the most important principles, theories and laws of chemistry, providing theoretical basis for acquiring other skills, mastering specific skills related to the application of theoretical knowledge, the development of creative skills and practical skills necessary for the exercise of the profession.			
Learning Outcomes: After completing the course of Medicinal chemistry, students will train the application of theoretical and practical knowledge both in life and in the acquisition of other knowledge (eg, biochemistry and physiology, etc.). In terms of practical knowledge and skills students will be able to compute in chemistry, handling basic laboratory equipment, perform basic volumetric determinations and basic instrumental measurements. In addition to this, students should be able to continue their studies or to apply their knowledge.			
Syllabus: <i>Theory</i> The structure of atoms and molecules and the periodic table of elements. Electronic configuration of atoms and the periodic table of elements. Chemical bonds and intermolecular forces. Thermochemistry and chemical kinetics. Heat effect of chemical reactions. Chemical reaction rates and law of mass action. Chemical equilibrium and factors that affects chemical equilibrium. The solutions. Solubility and solubility product constants. Colligative properties of solutions. Osmosis and dialysis. Electrolytic dissociation. Acids and bases. Hydrolysis and buffers. pH value. Classification of dispersed system. Colloids. Redox potential and bioelectricity The biogenic elements. Chemical properties of biogenic elements and compounds. The importance of some biogenic elements in animals. Organic chemistry. Structure and classification of organic compounds. Functional groups. Classification of hydrocarbons. Types of organic reactions. Chemical signals – pheromones and allelochemicals. Organochlorine compounds and organochlorine anesthetics. Organic compounds with oxygen. Oxidation-reduction processes in organic chemistry and biochemistry. Alcohols, phenols, aldehydes, ketones and carboxylic acids. Substituted carboxylic acids and carboxylic acid derivatives. Organic compounds with nitrogen. Classification of organic compounds with nitrogen. Classification of amines and properties amine. Biologically important amines and neurotransmitters. The basic character of organic compounds with nitrogen. The most important heterocyclic compounds and their importance. Psychoactive substances. Biomolecules. Classification of biomolecules. Carbohydrates. Fatty acids, lipids, oils, and soaps. Phospholipids. Biological membranes. The amino-acids and proteins. Nucleosides, nucleotides and ATP. The nucleic acids. Bases of medicinal chemistry. Classification, structure and mechanism of action of the most important representatives of antibiotics, cytostatics and antiviral medications. <i>Practice</i> 1. Laboratory equipment and methods for separation of substances. 2. Mole-mass calculations. Calculations in chemistry. 3. Measuring the mass and volume. Dissolving and quantifying the composition of the solution. 4. The solution calculations. Dilution. 5. Preparing the solution of known quantitative composition. 6. Acids and bases (pH and stoichiometric calculations). 7. Acidimetry – Determination of NaOH with standard solution of HCl. 8. Redox reactions. 9. Permanganometry – Determination of Fe(II) ion with standard solution of KMnO ₄ . 10. Hydrocarbons (nomenclature and chemical reaction). 11. Organic compounds with oxygen. 12. Organic compounds with nitrogen, carbohydrates and lipids.			
Required Reading: 1. Б. М. Поповић, Д. Штајнер, Р. Ждеро Павловић, Б. Благојевић, Н. Мићић: Практикум из хемије са теоријским основама и збирком питања и задатака, Пољопривредни факултет, Нови Сад, 2008. 2. Gorzynski Smith, J. General, Organic & Biological Chemistry. Mc Graw-Hill, New York, 2010. 3. Д. Штајнер, С. Кеврешан, Хемија, Пољопривредни факултет, Нови Сад, 2006.			
Weekly Contact Hours:		Lectures: 2	
		Practical work: 3	
Teaching Methods: Lectures and students group work			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Active class participation		written exam	60
Practical work		oral exam	If necessary
Preliminary exam(s)	40	
Seminar(s)			