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| **Study program:** Chemistry (PhD) |
| **Course title: Selected chapters of bioinorganic chemistry** |
| **Name of lecturer/lecturers Maja N. Stanković** |
| **Type of course: elective**  |
| **Number of ECTS allocated** |
| **Course objectives**Acquaintance of students with the importance of chemical elements in the living world (bio-metals and bioligands), as well as with toxic properties of essential elements. Understanding the essence of life-important processes in which they unfold Fe, Cu, Na, K, Ca, Zn, and other elements participate and are necessary. Acquiring knowledge about the practical application in medicine, biology, protection of human environment, food production and toxicology of bio-metals. |
| **Course outcomes**Upon successful completion of this course, the student can:• look at the biological significance of chemical elements, primarily metals,• understand the role of the same in biochemical and life-important processes that continuously take place in living organisms,• critically approaches and analyzes facts in communication with experts from other disciplines solving multidisciplinary problems in the protection of the human environment, in biology, medicine, food production, toxicology. |
| **SYLLABUS***Lectures**Bioelements, biometals, bioligands. Biological importance of alkali metals. Biological significance of alkaline earth metal. Metalloproteins and metalloenzymes. Bioinorganic iron chemistry. The bioinorganic chemistry of cobalt, manganese and nickel. Biological importance of zinc. Copper as a bioelement. Biological importance of molybdenum. Bioinorganic chemistry of chromium and vanadium. Toxicity of bioelements. Chemotherapy significance of bioelements. Model systems of the coordination compounds of biometals, synthesis, characterization and spectroscopic study (Fe, Cu, Zn, Mo, Co, Mn). Mobility and migration of alkaline ions and alkaline earth metals. Biomineralization. Writing a seminar work; analysis and critical review.* |
| **References**Д. М. Ђорђевић, Р. С. Николић, Н. С. Крстић, Хемија прелазних метала, ПМФ Ниш, 2019. Р. С. Николић, Г. М. Николић, Д. М. Ђорђевић, Н. С. Крстић, КООРДИНАЦИОНА ХЕМИЈА – Основи, Вежбе и Други Облици Наставе, Природно-математички факултет Ниш, Ниш 2010. R. R. Crichton, Biological Inorganic Chemistry An Introduction, Elsevier, 2007 R. M. Roat-Malone, Bioinorganic chemistry, 2nd Edition. John Wiley & Sons, Inc., Hoboken, New Jersey, 2007 |
| **Active teaching classes** | **Lectures 105** | **Laboratory work** |
| **Teaching mode:** lectures, project teaching, seminar, case studies |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| activity during the lecture - 5 points; seminar work – 50 points; oral exam - 45 points |