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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  |  |
| **GENERAL INFORMATION** |
| Study program  | Doctoral: Chemistry |
| Study Module (if applicable) |  |
| Course title | Chemical Equilibria |
| Level of study | [ ] Bachelor [ ]  Master’s [x]  Doctoral |
| Type of course | [ ]  Obligatory [x]  Elective |
| Semester  |  [x]  Autumn [ ] Spring |
| Year of study  | first |
| Number of ECTS allocated | 8 |
| Name of lecturer/lecturers | Violeta Mitić |
| Teaching mode |  [x] Lectures [ ] Group tutorials [x]  Individual tutorials [x] Laboratory work [ ]  Project work [ ]  Seminar [ ] Distance learning [ ]  Blended learning [ ]  Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| The objective of the course is to learn to apply equilibrium constraints to a range of systems of interest in chemistry. This course introduces the protocol for modeling chemical systems at equilibrium. The always reliable protocol for modeling equilibria is based on conservation of charge and mass and constants characterized by equilibrium constants and standard redox potentials. Various methods for visualizing information about solutions and titrations will be presented.. At the end of the semester, students will be able to appreciate quantitatively the equilibrium behavior of species in the solution  |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Thermodynamics and equilibrium chemistry ,Mass balance (MB), Charge balance (CB) Reversible reactions and chemical equilibria. Reversible reactions and dynamic equilibriaEquilibrium constant. Disruption of equilibria. Predicting the extent of reaction Equilibrium constants for heterogeneous equilibria .Predicting the effect of disruptions on equilibriaEquilibrium constants and temperatureFractional concentrations. Autoprotolysis.Acid–base equilibria. Buffers equilibria. Amphiprotic speciesComplexation equilibria metal-ligand formation constants. Stability constants and entropy - the chelate effectSolubility equilibriaOxidation/reduction equilibriaSystematic approach to solving equilibrium problems |
| **LANGUAGE OF INSTRUCTION** |
| [x] Serbian (complete course) [ ]  English (complete course) [ ]  Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)[ ] Serbian with English mentoring [ ] Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **10** | **Written examination** | **25** |
| **Practical teaching** |  | **Oral examination** | **25** |
| **Teaching colloquia** | **40** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |