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| **Study program** Chemistry | | | | |
| **Course title** Calculations in chemistry | | | | |
| **Name of lecturer/lecturers** Jelena S. Nikolić | | | | |
| **Type of course** Obligatory | | | | |
| **Number of ECTS allocated** 3 | | | | |
| **Course objectives**  Acquiring theoretical knowledge about the key concepts of calculations in chemistry. Training students for application standard methodologies in solving concrete tasks and problems in chemistry. Providing a knowledge base from basic calculus in chemistry as a foundation for successful mastery of the material during further chemical education. | | | | |
| **Course outcomes**  Upon the course, the student is able to:  - Apply theoretical knowledge based on an understanding of basic chemical definitions in solving problems and tasks;  - Recognizes and solves chemical tasks and problems and applies acquired knowledge within other disciplines and  subject.  - Demonstrates knowledge and understanding of basic facts and concepts related to stoichiometry, composition of solutions, homogeneous and heterogeneous equilibria in aqueous solutions; | | | | |
| **SYLLABUS**  *Lectures*  Mathematical operations in chemical calculations. Basic stoichiometric calculations in chemistry.  Expressing the composition of the solution. Dilution and mixing of solutions. Equilibrium. Calculation of pH in solutions. Heterogeneous equilibria: solubility product and solubility. Complex building equilibria: stability constant of the complex. Equilibria in redox systems.  *Laboratory work*  Computational tasks in the field of stoichiometric calculations. Computational tasks from the calculation of the composition of the solution, dilutions, mixing solutions and pH. Computational tasks in the field of heterogeneous balances, balance in complexing environments and redox systems. | | | | |
| **References**   1. M. Sikirica, Stehiometrija, Zagreb : Školska knjiga, 1984 2. D. Skoog, D. West, J. Holler, Osnove analitičke hemije, Zagreb : Školska knjiga, 1999 3. L. Hamilton, S. Simpson, D. Ellis, Calculations of analytical chemistry, McGraw-Hill : Tokyo, 1969 4. F. Abaffy, Zbirka zadataka iz analitičke kemije, Zagreb : Školska knjiga, 1973 | | | | |
| **Active teaching classes** | **Lectures** 15 | | **Laboratory work** 15 | |
| **Teaching mode** Lectures, theoretical examples and consultations | | | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | | | |
| **Pre exam duties** | **Points** | **Final exam** | | **Points** |
| Activity during lectures | 10 | Written examination | | 30 |
| Homework | 10 | Oral examination | |  |
| Teaching colloquia | 50 |  | |  |
| Seminar |  |  | |  |