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| **Study program** Chemistry | | | | |
| **Course title** Analytical chemistry 2 | | | | |
| **Name of lecturer/lecturers** Violeta D. Mitić | | | | |
| **Type of course** Obligatory | | | | |
| **Number of ECTS allocated** 7 | | | | |
| **Course objectives**  - acquiring basic knowledge about gravimetry as a basic classical method of quantitative chemical analysis.  - training student to take representative samples of different origins and select proper ways to prepare samples for analysis.  - evaluating, processing and interpreting the results of quantitative analysis. | | | | |
| **Course outcomes**  After successfully completing the Analytical Chemistry 2 course and passing the exam, a student is able to:  - know all the processes related to the formation and treatment of the resulting precipitate  - applies basic separation techniques in quantitative analysis  - makes reliable, accurate and precise measurements  - applies the principles of good laboratory practice when performing analyses  - apply theoretical and practical knowledge about the methods of taking different types of samples (ores, alloys, minerals, plant material, food, water, soil, etc.) and carry out their preparation for analysis,  - based on the obtained data, perform processing, evaluation and interpretation of results of gravimetric methods of analysis,  - formulates conclusions based on the obtained results of laboratory work and statistical processing of results  - apply the acquired knowledge in the further study of analytical chemistry | | | | |
| **SYLLABUS**  *Lectures*  Chemical methods of analysis: Principles of quantitative chemical analysis. Division of chemical methods  analysis. Gravimetry. Precipitation gravimetry. Precipitation and precipitate particle size: Mechanism of precipitation. Colloidal precipitates: Adsorption on colloidal precipitates. Coagulation and peptization. Hydrophilic and hydrophobic colloids. Calculations in quantitative analysis. Crystalline precipitates: Conditions for the formation of crystalline precipitates. Characteristics of crystalline precipitates. Aging of precipitate and digestion. Precipitation from homogeneous solutions. Precipitation using collector. Precipitate contamination: Coprecipitation. Adsorption. Occlusion. Inclusion. Post-precipitation. Reprecipitation. Water in solids. Hygroscopicity and drying agents. Precipitation reagents: Inorganic precipitation reagents. Organic precipitation reagents.  Statistical processing of analytical results: Types of errors: random and systematic errors, absolute error, relative error, variance. Basic measurement parameters: accuracy, precision, sensitivity, repeatability, reproducibility. Confidence interval. Statistical tests,  Selection of methods for the analysis of real samples: Preparation of samples for analysis. Sampling. Decomposition and sample dissolution: Sources of error during dissolution and decomposition. Decomposition of the sample by inorganic acids. Degradation of samples by melting. Wet and dry decomposition procedures. Removal of interference. The nature of the separation process. Separation by precipitation. Separation by extraction, distillation, ion exchange, chromatography. Masking and unmasking in analytical chemistry: Basic masking reagents. Unmasking based on alteration reactions. Unmasking by breaking down or physically removing the masking reagent.  *Laboratory work*  Gravimetric determination of iron  Gravimetric determination of nickel  Gravimetric determination of calcium and magnesium in a mixture  Gravimetric determination of sulfur in sulfide ores | | | | |
| **References**  J. Savić, M. Savić, Osnovi analitičke hemije, Svijetlost, Sarajevo, 1987.  M. Miljković, R. Simonović, V. S. Jovanović, Gravimetrijske metode analize, Niš, 2000.  T. Pecev, i dr., Kvantitativna analitička hemija - zbirka zadataka, Niš, 2002.  D. A. Skoog, D. M. West, F. G. Holler, Osnove analitičke kemije, Školska knjiga, Zagreb, 1999. | | | | |
| **Active teaching classes** | **Lectures** 30 | | **Laboratory work** 90 | |
| **Teaching mode** Lectures, laboratory work, consultations | | | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | | | |
| **Pre exam duties** | **Points** | **Final exam** | | **Points** |
| Activity during lectures | 5 | Written examination | | 20 |
| Practical teaching | 20 | Oral examination | | 15 |
| Teaching colloquia | 40 |  | |  |