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| **Study program** Chemistry | | | | |
| **Course title** Data treatment in chemistry | | | | |
| **Name of lecturer/lecturers** Ivana D. Rašić-Mišić | | | | |
| **Type of course** Elective | | | | |
| **Number of ECTS allocated** 4 | | | | |
| **Course objectives**  Enabling students to use basic statistical terms and understand the purpose of data processing. Developing the student's ability to apply the correct way of processing measurement results, as well as the proper way of displaying the obtained results using statistical methods. Empowering students for the correct interpretation of the obtained data. | | | | |
| **Course outcomes**  Upon completing this course, the student is able to:  - defines errors types  - defines sources of measurement uncertainty,  - show and apply ways of reducing errors in laboratory work,  - determine the accuracy and precision of measurements,  - calculate the error of the derived result,  - compare the measurement results and  - apply appropriate programs for processing and graphical displaying of results | | | | |
| **SYLLABUS**  *Lectures*  Introduction to statistics. Defining accuracy and precision. Absolute error, relative error, calculations. Standard deviation. Coefficient of variation. Variance. Types of errors: systematic, random and gross errors. Sources of errors, impact of errors on result and ways of their elimination. Methods for presenting analytical data, significant figures, rules for rounding approximate numbers, significant figures in mathematical operations. Error of derived result. Definition of terms: center, median, span. Processing and evaluation of statistical data. Confidence interval. Practicing the calculation of learned concepts. grouping, arranging and displaying data. Application of computer programs in the display of obtained data results. Gaussian normal distribution curve. Introduction to statistical tests. Testing external results. Fisher's test, Student's t tests. Application of computers in the performance of statistics  *Laboratory work*  Using examples, students will calculate the basic statistical terms and apply statistical programs for data processing. Determining the mean value of a series of measurements, precision and accuracy. Determining the sensitivity of the method. Determination of the working range of the method. Determination of analyte content by standard addition method. | | | | |
| **References**  M.Kaštelan-Macan, Kemijska analiza u sustavu kvaliteta, Školska knjiga, Zagreb, 2003.  D. A. Skoog, D. M. West, F. G. Holler, Osnove analitičke kemije, Školska knjiga, Zagreb, 1999.  J. Savić, M. Savić, Osnovi analitičke hemije-klasične metode, Svjetlost, Sarajevo, 1987.  I. Gutman, Obrada rezultata hemijskih merenja, Prirodno-matematički fakultet Kragujevac, 2000 | | | | |
| **Active teaching classes** | **Lectures** 30 | | **Laboratory work** 15 | |
| **Teaching mode** lectures, theoretical exercises, laboratory work, consultations | | | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | | | |
| **Pre exam duties** | **Points** | **Final exam** | | **Points** |
| Activity during lectures | 5 | Written examination | | 15 |
| Practical teaching | 20 | Oral examination | | 30 |
| Teaching colloquia | 30 |  | |  |
| Seminar |  |  | |  |