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| **UNIVERSITY OF NIŠ** | | | | | | |
| **Course Unit Descriptor** | | **Faculty** | | | Faculty of Science and Mathematics | |
| **GENERAL INFORMATION** | | | | | | |
| **Study program** | | | | **Physics** | | |
| Study Module (if applicable) | | | |  | | |
| Course title | | | | Metrology and Measurements Data Analysis | | |
| Level of study | | | | Bachelor  Master’s  Doctoral | | |
| Type of course | | | | Obligatory  Elective | | |
| Semester | | | | Autumn Spring | | |
| Year of study | | | | 1 | | |
| Number of ECTS allocated | | | | 5 | | |
| Name of lecturer/lecturers | | | | Zoran Pavlović | | |
| Teaching mode | | | | Lectures Group tutorials  Individual tutorials  Laboratory work  Project work  Seminar  Distance learning  Blended learning  Other | | |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** | | | | | | |
| The course aims to introduce students to the concepts of the Metrology and Measurements Data Analysis.  Acquired knowledge is necessary for further scientific and professional work, research work and application of physics measurements and data analysis. | | | | | | |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** | | | | | | |
| Need of measurements a physical quantities. Errors of measurements and their classification, systematic and random errors. Precision and accuracy, measurement uncertainty. SI units, definition standard basics units, definition of basics and derived physical quantities. Quantum etalons of physical quantities. Statistical treatment of the measurement results. Histograms. Probability density distribution function and cumulative probability distribution function. Characteristics of probability distributions, discrete and continuous random variables: mathematical expectation, mode, median, mean values and standard deviation, central distribution moments, covariance and correlation coefficient. Some probability distributions: Binomial distribution, Poisson distribution, Gaussian distribution, Students *t* distribution, Chi-Square distribution, Fisher *F* distribution, uniform distribution, exponential distribution. Curve fittings: least square method, linear and nonlinear fits, Lagrange polynomial interpolation. Analog and digital measuring instruments and their characteristics. Measurement uncertainty type A and type B, total measurement uncertainty. | | | | | | |
| **LANGUAGE OF INSTRUCTION** | | | | | | |
| 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** | **7** | | **Written examination** | | | **20** |
| **Practical teaching** | **13** | | **Oral examination** | | | **20** |
| **Teaching colloquia** | **40** | | **OVERALL SUM** | | | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** | | | | | | |