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| **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty** | Faculty of Mechanical Engineering |
| **GENERAL INFORMATION** |
| Study Program | **Mechanical Engineering** |
| Study Module (if applicable) | - |
| Course Title |  Micro and Nanotechnologies |
| Level of Study | ☐Bachelor | ☐ Master’s | ☒ Doctoral |
| Type of Course | ☐ Obligatory | ☒ Elective |
| Semester | ☒ Autumn | ☐ Spring |
| Year of Study | II |
| Number of ECTS Allocated | 10 |
| Name of Lecturer/Lecturers | Miloš S. Milošević [Јеlеnа Z. Manojlovi](file:///C%3A%5CUsers%5CDusan%5CDownloads%5Cakredicija%20-prevod%5CJelena%5Cpredmeti%20jelena%5CPrilog_9.5_Knjiga_nastavnika.doc#Jelena_Manojlovic)ć |
| Teaching Mode | ☒ Lectures | ☐ Group tutorials | ☒ Individual tutorials |
| ☒ Laboratory work | ☒ Project work | ☒ Seminar |
| ☐ Distance learning | ☐ Blended learning | ☐ Other |
| **Purpose and Overview (max. 5 sentences)** |
| *Introducing in micro-and nanotechnologies, materials, principles, physical effects and phenomena important in the micro-and nano-environment. Providing a theoretical basis, reviewing the necessity of application of micro-and nano-systems in different areas and possibilities of further development of micro-and nanotechologies. Training for understanding phenomena in micro-and nano world (typical physical phenomena such as friction, adhesion, wear, lubrication, etc.). With that knowledge students can have deeper understanding of the causes for the occurrence of such phenomena and for application of the acquired knowledge for designing micro-and nano-elements and systems.* |
| **Syllabus (brief outline and summary of topics, max. 10 sentences)** |
| Physical basis of micro-and nanomechanics (material properties, physical effects, principles and phenomena in micro-world). The study of phenomenon of friction, adhesion, wear and lubrication at the molecular level. Research of chemical, physical and mechanical properties of surfaces. Instruments for research of phenomena at micro-and nano level. Technologies of micromechanics and nanotechnology. Models of phenomena important for functioning micro-and nanosystems. Small dimensions devices, micro (MEMS) and nanoelectromechanical systems (NEMS). The further development of micro-and nanotechnology. Analysis of physical effects, principles and phenomena in micro-and nanoelectromechanical systems. Modelling and simulation of functional principles of micro-and nano systems. Application of technologies of micromechanics and nanotechnology for designing micro-and nano-elements and systems. Experimental analysis of micro- and nanosystems in the laboratory. |
| **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** | **10** | **Written Examination** | **0** |
| **Practical Teaching** | **10** | **Oral Examination** | **20** |
| **Teaching Colloquia** | **60** | **Overall Sum** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |