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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Science and Mathematics |
| **GENERAL INFORMATION** |
| Study program  | PhD studies |
| Study Module (if applicable) | Applied chemistry |
| Course title | Chemistry of surface processes |
| Level of study | ☐Doctoral |
| Type of course | ☒Elective  |
| Semester  |  ☐ Autumn  |
| Year of study  | 1nd |
| Number of ECTS allocated | 8 (eight) |
| Name of lecturer/lecturers | Aleksandra Zarubica and Marjan Ranđelović |
| Teaching mode |  ☒Lectures , ☒Laboratory work , Project work, Seminar ☐ |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| This course provides students with the highest level of knowledge in the field of chemical and physico-chemical aspects of surface processes on solid phase systems. Moreover, students acquire the ability to use knowledge to set up and solve a specific problems and projects that are based on surface processes - catalytic and / or adsorption phenomena.Students are trained to:professionally set up the project plan on appropriate topic regarding the chemistry of the surface processes and align it with the principles of sustainable development; establish appropriate relation between the selected material parameters (texture, structure, morphology) and achieved effects in the test-processes; discusse the physical-chemical, thermodynamic and kinetic parameters of surface processes (adsorption and / or catalysis); independently perform the necessary analysis (theoretical-mathematical or software approach), and establish optimized process parameters. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Chemistry of surface states; Adsorption on the surface of stoichiometric and nonstoichiometric oxides; Adsorption on the surface of stoichiometric and nonstoichiometric sulfides; Catalysis on the surface of stoichiometric and nonstoichiometric oxides; Catalysis on the surface of stoichiometric and nonstoichiometric sulfides; The active centers of adsorption and / or catalysis - surface phenomena; Types of surface reactions / processes; Chemical characterization on the volume level; Chemical characterization of surfaces; Analysis / characterization of crystalline and amorphous structure of the material; Crystalline lattice defects; Characterization / analysis of impurities / dopants in the crystal lattices; Analysis / characterization of material architecture; Distribution of crystalline phases in materials; The applications and consequences of surface processes - perspectives and trends. |
| **LANGUAGE OF INSTRUCTION** |
| ☒Serbian (complete course) ☐ English (complete course) ☐Serbian with English mentoring ☐ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **0** | **Written examination** | **50** |
| **Practical teaching** | **0** | **Oral examination** | **50** |
| **Teaching colloquia** | **0** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |