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| **Study program:** Doctoral academic studies **-** Chemistry | | |
| **Course title:** Chemistry of Surface Processes (H344C) | | |
| **Name of lecturer/lecturers:** Aleksandra R. Zarubica, Marjan S. Ranđelović | | |
| **Type of course:** elective | | |
| **Number of ECTS allocated:** 10 | | |
| **Course objectives**  Acquiring the highest level of chemical and physical-chemical knowledge about nanostructured materials and technologies of their processing, and the ability to use knowledge in setting/solving specific problems, projects and questions related to the synthesis, characterization and application of nanostructured materials. | | |
| **Course outcomes**  After the successful completion of the course, the student will be able to: professionally plan and set the work to the appropriate topic in the field of nanostructured materials and harmonizes it with the principles of sustainable development; establish appropriate dependencies of selected parameters of nanomaterials (texture, structure, morphology) with realized effects in test processes; considers the physico-chemical, thermodynamic and kinetic parameters of the processes in which it is applied high technology nanomaterials (adsorption and/or catalysis); independently performs the necessary analysis (theoretical mathematical or software approach), and establishes optimized parameters of the process of synthesis and application nanomaterials. | | |
| **SYLLABUS**  *Lectures*  Nanotechnology - theoretical approach. Application of nanotechnologies in different fields. Chemical approach to nanostructured materials. Synthesis of nanostructured materials. Three-dimensional processing nanostructured materials. Types of semiconductor nanomaterials. Application of semiconductors nanomaterials. Characterization of semiconductor nanomaterials. Synthesis of nanotubes and/or nanofibers based on different chemical composition. Structure of nanotubes/nanofibers. Characterization of nanotubes/nanofibers. Use nanotubes and nanofibers. Synthesis and structure of nanomaterials with different dimensions (films and coatings). Characterization of nanomaterials with different dimensions - films and coatings. Application of nanomaterials with different dimensions (films and coatings). Synthesis and structure of zeolite. Characterization of zeolite. Applications of zeolites. | | |
| **References**  1. W. A. Goddard, D. W. Brenner, S. E. Lyshevski, G. J. Iafrate (eds.), Handbook of Nanoscience, Engineering and  Technology, CRC Press, Florida, 2002.  2. H. S. Nalwa (ed.), Nanostructured Materials - Nanotechnology, Academic, California, 2002.  3. M. Koehler, W. Fritzsche, Nanotechnology, Wiley, New York, 2004.  4. M. Meyyappan (ed.), Carbon Nanotubes: Science and Application, CRC Press, Florida, 2004. | | |
| **Active teaching classes** | **Lectures:** 105 | **Laboratory work:** / |
| **Teaching mode:** mentorship, interactive teaching, scientific-research work, seminar | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | |
| written exam - 50 points; oral exam - 50 points | | |