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| **Study program** Master Studies |
| **Course title** Advanced course in inorganic chemistry (H200C) |
| **Name of lecturer/lecturers** Dragan M. Đorđrvić, Nenad S. Krstić |
| **Type of course** Obligatory |
| **Number of ECTS allocated 5** |
| **Course objectives**Getting to know the physical-chemical properties of rare and scattered elements on Earth, lanthanoids andactinoids, their use and importance in different areas of human activity. Developing the ability to recognize the advantages and disadvantages of using certain natural resources, taking into account the beneficial and harmful consequences of their use, especially natural and artificial radionuclides |
| **Course outcomes**Having finished this course successfully, a student will be able to:• systematically understand the physical-chemical properties of rare elements and radioactive elements and possess knowledge of their basic application,• distinguish the advantages and limitations of the techniques used in the characterization of s-, p- and d- elements on the one hand and f-elements on the other,• independently carries out oral and written communication, independent work and professional work planning,• clearer and more complete understanding of environmental problems related to the use, storage and disposal of used products based on these metals, some of which are raw materials, and some very dangerous nuclear waste. |
| **SYLLABUS***Lectures*Introduction. Distribution and occurrence of lanthanoids in nature. Minerals. Obtaining and production. Physicochemical properties. Lanthanoid compression. Electronic configuration. Oxidation states. Binary lanthanide compounds. Complex compounds of lanthanides. Spectral and magnetic characteristics of ions and compounds. Chemistry of organometallic lanthanoid compounds. Application of lanthanides. Actinoids. Prevalence. Minerals. Getting. Physical-chemical properties of actinoids. Spectral and magnetic characteristics. Complex actinoid compounds and their importance. Actinium, thorium, protactinium. Uranium. Transuranium elements and elements with an atomic number greater than 103. Nuclear waste.*Laboratory work*Review of Inorganic Chemistry. s, p, d, f-metals. Coordination compounds. Lanthanoid chemistry. Radioactive minerals and elements. Radioactive decay. Transuranium elements. Interesting things from the chemistry of lanthanides and actinoids. Application of selected lanthanoid and actinoid compounds. |
| **References**1. S. Cotton, G. Wilkinson, Advanced Inorganic Chemistry. John Wiley & Sons, 1976. 2. V. Janković, Hemijski elementi, Zavod za udžbenike, Belgrade, 2002. 3. S. Cotton, Lanthanide and Аctinide chemistry, Wiley, 2007. |
| **Active teaching classes** | **Lectures** 45 | **Laboratory work** 15 |
| **Teaching mode**Interactive lectures, theoretical exercises, laboratory exercises, homework, seminar work, panel discussions |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| **Pre exam duties** | **Points** | **Final exam**  | **Points** |
| Activity during lectures | 5 | Written examination | 20 |
| Practical teaching | 15 | Oral examination | 20 |
| Teaching colloquia | 20 |  |  |
| Seminar | 20 |  |  |