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| **Study program** Applied chemistry with the management basics |
| **Course title** Selected chapters of inorganic chemistry (H245C) |
| **Name of lecturer/lecturers** Dragan M. Đorđević, Nenad S. Krstić |
| **Type of course** obligatory |
| **Number of ECTS allocated** 5 |
| **Course objectives**Getting to know and understanding the importance of the physical and chemical properties of rare and scattered elements on Earth, lanthanides and actinoids. Acquiring knowledge about their use in different areas of human activity. Developing the ability to recognize the advantages and disadvantages of using certain natural resources considering the beneficial and harmful consequences of using them, especially natural and artificial radionuclides. |
| **Course outcomes**After successfully completing this course, the student is able to:• systematically understand the physical and chemical properties and basic application of rare elements and radioactive elements,• differentiate the advantages and limitations of the techniques used in the characterization of s-, p- and d-elements with on the one hand and f-elements on the other hand,• independently carry out oral and written communication, independent work, and professional work planning,• more clearly and fully perceive the environmental problems related to the use, storage and disposal of used materials products based on these metals, some of which are raw materials, and some of which are 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 lanthanoid 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. Physico-chemical properties of actinoids. Spectral and magnetic characteristics. Complex actinoid compounds and their importance. Actinium, thorium, protactinium. Uranus. Transuranic 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. Chemical behavior of lanthanoids. Radioactive minerals and elements. Radioactive decay. Transuranic elements. Interesting facts from lanthanoid and actinoid chemistry. 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, Beograd, 2002.3. S. Cotton, Lanthanide and Аctinide chemistry, Wiley, 2007. |
| **Active teaching classes** | **Lectures** 45 | **Laboratory work** 15 |
| **Teaching mode**Interactive lectures, theoretical exercises, homework, seminar, panel discussion |
| **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 |  |  |