|  |  |  |
| --- | --- | --- |
| **Study program:** Chemistry (PhD) | | |
| **Course title: Selected chapters of environmental chemistry (H341C)** | | |
| **Name of lecturer/lecturers Tatjana D. Anđelković** | | |
| **Type of course: elective** | | |
| **Number of ECTS allocated 10** | | |
| **Course objectives**  Explanation of more complex chemical processes in the environment and their interrelationship and conditions. A special review is given to biogeochemical processes that occur both in unpolluted and in polluted systems, as well as the monitoring of chemical forms in tanks, exchange pools and flux of substances during their migration. | | |
| **Course outcomes**  By applying the acquired knowledge about processes in the environment, the student can independently study, predict, and define the impact, interaction and distribution of various anthropogenic pollutants of natural origin in the environment. Also, the student is trained to apply the method modeling and predict the distribution of pollutants from sediments into the aquatic environment. The student shows systematic understanding of experimental methods used in environmental chemistry research and demonstrates the ability to design, apply and develop research in environmental chemistry. | | |
| **SYLLABUS**  *Lectures*  Inorganic pollutants: heavy metals - sources, characteristics, exogenous influences; transformations and fate of heavy metals in nature - Eh/pH, in soil, sediments, water, air; radioactive nuclides. Organic pollutants: sources, fate, identification. Industrial chemicals (PCBs, hexachlorobenzene), pesticides (aldrin, DDT, dieldrin, endrin, hexabromobiphenyl, heptachlor, chlordane), byproducts of combustion (dioxins, PAHs, PCBs), fossil fuel pollutants, pharmaceuticals products. Ecotoxicology. Mechanisms of toxicity and toxic effects. Input of xenobiotics in the living organisms. Ecotoxicity of organic and inorganic pollutants. Processes in the environment: ionic exchange, partition, chemical and biochemical processes (hydrolysis, redox reactions, photoinduced reactions, complexation, biochemical transformations). Migration of pollutants. Migration of hydrocarbons. POP migration. Migration of heavy metals. Thermodynamics, kinetics and mechanisms transformation reactions. Modeling of processes in the environment. Kinetic modeling. Quasi thermodynamic modeling. Estimation of phase distribution. | | |
| **References**  7. П. Пфент, Хемија животне средине I део, Завод за уџбенике, Београд, 2009.  8. Gary W. Van Loon, Stephen J. Duffy, Environmental chemistry – a global perspective, Oxford University Press, Oxford, 2000.  9. Ernest Hodgson, A Textbook of Modern Toxicology, John Wiley & Sons, 2011.  10. W George Fong, H Anson Moye, John P Toth, Pesticide Residues in Foods: Methods, Techniques, and Regulations, Wiley-Interscience, 1999. | | |
| **Active teaching classes** | **Lectures 105** | **Laboratory work** |
| **Teaching mode: Interactive lectures, homework, seminar work, panel discussions** | | |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** | | |
| Teaching colloquia - 30 points; seminar work – 20 points; oral exam - 50 points | | |