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| **Study program: Bachelor studies Chemistry** |
| **Course title: Fundamentals of environmental chemistry** (Х133Ц) |
| **Teacher/teachers: Tatjana D. Anđelković** |
| **Course status: compulsory** |
| **ESPB number: 4** |
| **Condition: /** |
| **Course objectives** Getting to know the most important chemical processes in the lithosphere, atmosphere and hydrosphere. Defining biogeochemical processes in unpolluted environments, the fate of the most important components of natural environments and their stability depending on environmental conditions, as well as defining the abiotic and biotic transformations to which they are subject. Getting to know the most important types of polluting substances in the environment, their anthropogenic and natural sources, classification and nomenclature. |
| **Course outcomes** The student should be able to: describe the chemical and physical characteristics of water, air and soil; explain the most important processes that take place in unpolluted natural environments; defines the most important parameters of water, air and soil quality; evaluate the relevant physico-chemical characteristics and reactivity of polluting substances based on their molecular structure; predict possible distributions and processes that pollutants in the environment can undergo; samples water, air and soil, prepares samples for analysis, plans an independent experiment and determines parameters with instrumentation used in practical classes; achieve oral and written communication, independent work, self-organization and work planning. |
| **Course content****Lectures:** Creation of chemical elements. Distribution of chemical elements. Formation of rocks, magmatic processes and differentiation of magma. Properties of minerals. Silicate minerals. Aluminosilicates. Clay minerals. Processes of surface decomposition. Formation, composition and properties of soil. Sorption processes in the soil. Ion exchange processes in soil. Redox processes in soil. Soil pollution, protection and remediation. Water as a chemical compound. Chemical components of natural waters. Hydrological and other biogeochemical cycles in nature. Basic indicators of water quality. Movement of substances in water. Processes in water. Water pollution, protection and purification. Characteristics of the atmosphere, composition and temperature profile. Air movement. Acid rain. Ozonosphere. Ozone holes. The greenhouse effect. Air pollution, protection and purification. Physical and chemical characteristics of polluting substances. Basics of ecotoxicological chemistry.**Practical teaching:** Basics of pollution measurement (sampling, sample preparation and conservation, choice of analytical method of determination, most commonly used units of concentration of polluting substances, analysis results and their processing, legal regulation of environmental protection, MDK concept, most commonly used standards for air and water quality control, in- in situ analysis). Acidity and alkalinity as parameters of natural water quality. Oxygen in water as a parameter of water quality. Water consumption of potassium permanganate as a parameter of water quality. Soil organic matter. Ammonia in the air. Remote access GC/MS (NETCHEM remote access platform). |
| **Literature**1. Д. Веселиновић, И. Гржетић, Ш. Ђармати, Д. Марковић, *Физичкохемијски основи заштите животне средине - стања и процеси у животној средини*, књига прва, Факултет за физичку хемију, Београд, 1995.2. Д. Веселиновић, И. Гржетић, Ш. Ђармати, Д. Марковић, *Физичкохемијски основи заштите животне средине - извори загађивања, последице и заштита*, књига друга, Научна књига, Београд, 1997.3. Ј. Перовић и Т. Анђелковић, *Детекција загађивача, практикум за вежбе*, ПМФ, Ниш, 2001.4. Gary W. Van Loon, Stephen J. Duffy, *Environmental chemistry – a global perspective*, Oxford University Press, Oxford, 2000. |
| **Active teaching classes** | **Lectures 30**  | **Laboratory work 15** |
| **Teaching mode: lectures, interactive teaching, theoretical exercises, demonstrations, seminars, consultations** |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| **Pre exam duties** | points | **Final exam** | points |
| Activity during lectures | 4 | Oral examination | 30 |
| Practical teaching | 20 |  |  |
| colokviums | 46 |  |  |