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| **Study program** Applied chemistry with the management basics |
| **Course title** Water and soil chemistry (H265C) |
| **Name of lecturer/lecturers** Aleksandar Lj. Bojić, Tatjana D. Anđelković i Nikola D. Nikolić |
| **Type of course** Obligatory |
| **Number of ECTS allocated** 7 |
| **Course objectives** Acquiring knowledge about chemical composition and processes of the solid, liquid and gaseous phase of soil and natural waters, chemical, physical-chemical and biological processes that take place in soil and water, as well as about methods of studying soil and water. Developing the ability to solve theoretical and experimental problems in monitoring the distribution of pollutants. |
| **Course outcomes**The student should be able to: * describe the chemical and physical characteristics of soil and water; explain how salinization, acidification, change in redox status and soil contamination affect the ecological land status;
* sample soil and water, prepares samples for analysis, independently plans an experiment and determines parameters with instrumentation used in practical classes;
* achieve oral and written communication, independent work, self-organization and planning of professional work.
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| **SYLLABUS***Lectures*Quality parameters and types of natural waters. Conditions and processes of formation of chemical and biological composition of natural waters. Pollution of natural waters, natural and anthropogenic sources of pollution. Behavior of chemical and biological pollutants in water. Quality assessment and classification of natural waters. Geochemical aspects of the structure and composition of the Earth and the Earth's crust. Geochemistry of igneous, metamorphic and sedimentary rocks. Complete geochemical analysis of limestone, igneous and silicate rocks. Origin of organic substance in sediments. Kerogen: definition, isolation and structure determination. Oil and gas. Coal: the origin, composition, classification, types according to the degree of classification. Chemical composition of the soil. Land as polydisperse system. Soil colloids and the role of colloids in creating soil structure. Buffering, acidity and alkalinity of the soil. Liquid and gaseous phase of soil.*Laboratory work*Collection of surface samples. water (processing, canning and preparation). Sedimentary and suspended substances in water. Determination of the dry residue of the filtered water. Organic loading of natural and waste waters (COD method). Extraction of soil humic substances. Hydrolytic acidity of the soil. Exchangeable acidity and exchangeable Al in soil. Determination of the sum of adsorbed basic cations and analysis of the adsorptive complex of the soil. Remote access GC/MS (NETCHEM remote access platform). Fractional analysis of samples of different origins. Isolation of kerogen and its characterization. |
| **References**1. M. Jakovljević, M. Pantović, Hemija zemljišta i voda, Naučna knjiga, Beograd, 1991.
2. Donald Sparks, Environmental soil chemistry, Academic Press, San Diego, 1995.
3. D. Neal Boehnke/R. Del Delumyea, Laboratory Experiments in Environm. Chemistry, Prentice Hall, 1999.
4. Gaćeša S., Klašnja M. Tehnologija vode i otpadnih voda, Jugoslovensko udruženje pivara, Beograd, 1994.
5. K.H. Wedepohl, Editioral Board: C.W. Correns, D.M. Shaw, K.K. Turekian, J. Zemann, Handbook of Geochemistry, Springer-Verlag Berlin-Heidelberg-New York (1969).
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| **Active teaching classes** | **Lectures** 60 | **Laboratory work** 30 |
| **Teaching mode**Lectures, interactive teaching, laboratory exercises, field teaching, consultations |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| **Pre exam duties** | **Points** | **Final exam**  | **Points** |
| Activity during lectures | 5 | Written examination | 30 |
| Practical teaching | 35 | Oral examination |  |
| Teaching colloquia | 30 |  |  |
| Seminar |  |  |  |