

Table 5.2 Course specification

Type and level of studies: Bachelor			
Course name: Removal of specific pollutants from drinking water			
Course status: elective			
Number of ECTS credits: 6			
Requirement: -			
Course aim Advanced study of chemical and microbiological processes for the removal of specific pollutants during drinking water treatment. Expanding knowledge regarding optimization of drinking water treatment and control of process parameters.			
Course outcome Upon completion of the course, the student will know to identify problems in the water supply process and suggest suitable technological solutions.			
Course content Relevant water supply issues related to the presence of specific contaminants: iron, manganese, inorganic nitrogen compounds, arsenic, gases and organic micropollutants. Available technologies that can be applied to eliminate specific pollutants. Physico-chemical and biological processes. Removal of iron and manganese: aeration/oxidation, filtration, ion exchange, biological processes. Nitrogen removal: ammonia - ion exchange, chemical oxidation, biofiltration), nitrite / nitrate removal - chemical and biological processes. Arsenic removal - coagulation, flocculation and other precipitation processes, sorption processes, membrane processes, oxidation. Organic micropollutants removal - hybrid processes: membrane filtration / adsorption on activated carbon powder, enhanced oxidation processes. Influence of different water quality parameters on the above processes / technologies, selection of optimal process parameters.			
Practice: Quantitative analysis of iron and manganese in water using atomic absorption spectroscopy. Determination of arsenic content in water using induced coupled plasma with mass detector. Speciation of arsenic in water using anion exchange resins. Arsenic removal by coagulation, sorption and membrane filtration. Application of advanced oxidation processes for the removal of selected organic micropollutants - chlorobenzene.			
Literature 1. Dalmacija B., Agbaba J., Klačnja M. (Ed.): Modern Methods in Drinking Water Preparation, Faculty of Science, Novi Sad, 2009. (In Serbian) 2. Crittenden, J.C., Rhodes Trussell, R., Hand, D.W. Howe, K.J., Tchobanoglous, G.: MWH's water treatment: principles and design, Wiley, 3rd edition, 2012. 3. Agbaba J., Dalmacija B., Becelic-Tomin M., Tubic A.: Drinking water quality, Faculty of Science, Department of Chemistry, Biochemistry and Environmental Protection, 2014. (In Serbian)			
Number of classes of active teaching: 5(75)			Other classes
Lectures: 3 (45)	Practice: 2 (30)	OFT: 2 (30)	
Teaching methods Lectures, lab work, consultations.			
Assessment of knowledge (maximum of 100 points)			
Pre-exam obligations	Points	Final exam	points
activities during lectures	5	written exam	30
practical teaching	20	oral exam	30
colloquium	15		