

<b>Course Title:</b> PHYTOREMEDIATION		
<b>Professor:</b> Dr. Milan Borišev, Dr. Slobodanka Pajević		
<b>Status of the subject:</b> Elective		
<b>Number of ECTS:</b> 15		
<b>Prerequisites:</b> -		
<b>Course Objective:</b> Getting students familiar with application of phytoremediation, and the followup physiological processes which underline these applications. Specific metabolic properties, and growth forms of plant species which are selected as useful tools in this technology. Types of specific ecosystem pollution which is suitable for this process of remediation.		
<b>Course Outcome:</b> By learning theoretical and practical examples in the phytoremediation field, students will become aware with one specific aspect of applied plant physiology. Specific parts of plant metabolism will be analysed within specific plant species which are metabolically compatible with according pollutants in the environment. Students will went through different methods of analyses aiming to assess phytoremediation potential of different plant forms and plant taxons.		
<b>Course Content:</b> <b>Theory:</b> Pollution sources. Pollutant types. Ecosystems and human health in relation to pollutants. Interaction of various pollutant species and plants. Metabolic specificity of plant species and forms in phytoremediation. Application potential of plants in remediation. Phytoremediation types. Economical and technological demands in phytoremediation. Methods of experimental analyses in phytoremediation. Current development of phytoremediation. Molecular markers in phytoremediation. Research practice: Analyses of pollutant content in plant samples collected at polluted sites. Designing experiments for analyses of phytoremediation potential in controlled conditions. Analyses of molecular indicators in phytoremediation.		
<b>Recommended literature:</b> Ansari A.A., Gill S.S., Gill R., Lanza G.R., Newman L. (Eds). 2016. Phytoremediation. Management of Environmental Contaminants, vol. 3., Springer International Publishing Switzerland ISBN 978-3-319-40146-1. DOI 10.1007/978-3-319-40148-5 Slobodanka Pajević, Milan Borišev, Nataša Nikolić, Danijela D. Arsenov, Saša Orlović, Milan Župunski (2016): Phytoextraction of Heavy Metals by Fast-Growing Trees: A Review. In: Phytoremediation: Management of environmental contaminants, vol. 3 (Abid Ali Ansari, Sarvajeet Singh Gill, Ritu Gill, Guy R. Lanza, Lee Newman, eds.). Springer International Publishing Switzerland, pp. 29-64. ISBN 978-3-319-40146-1. DOI 10.1007/978-3-319-40148-5 Sana Ashraf, Qasim Ali, Zahir Ahmad Zahir, Sobia Ashraf, Hafiz Naeem Asghar, Phytoremediation: Environmentally sustainable way for reclamation of heavy metal polluted soils, Ecotoxicology and Environmental Safety, Volume 174, 2019, Pages 714-727, ISSN 0147-6513 Karen E. Gerhardt, Perry D. Gerwing, Bruce M. Greenberg, Opinion: Taking phytoremediation from proven technology to accepted practice, Plant Science, Volume 256, 2017, Pages 170-185, ISSN 0168-9452.		
<b>Total hours:</b>	Lectures: 5	Student research work: 5
<b>Methods of instruction:</b> Theoretical lectures, mentor work, consultations, writing review papers, literature survey, laboratory practice under supervision, demonstration of laboratory procedures		
<b>Assessment (maximum number of points 100)</b>		
<b>Requirements</b> Student activity 10 points, Writing essays 40 points, Oral exam 50 points		