



Course ID: HZO113	Course name: PHYTOREMEDIATION OF TOXIC METALS		
Cycle: SECOND	Year: FIRST	Semester: I	ECTS credits: 6
Course status: ELECTIVE	Total course hours: 90 Lectures: 30 Laboratory: 60		
Teaching participants:	Teachers and associates with expertise in the field to which the subject belongs [do not enter names in this section. Leave the wording as indicated in this section]		
Prerequisite for enrollment:	-		
Course aims:	Acquiring basic knowledge of remediation of contaminated sites (soils) using phytoremediation		
Thematic course units:	<ol style="list-style-type: none">1. Definition, application, advantages, and disadvantages of phytoremediation2. Environmental contamination with heavy metals3. Total and bioavailable metal concentrations4. Use of hyperaccumulating plants5. Metal uptake and translocation in plants6. Phytoremediation techniques7. Phytostabilization8. Knowledge test9. Phytoextraction10. Removal of heavy metals from the soil by phytoextraction11. Induced phytoextraction12. Phytoremediation of polluted waters13. Increasing plant tolerance to metals14. Bioconcentration15. The efficiency of the phytoremediation process, legislation		
Learning outcomes:	The student will be able to: state and explain the division and principles of phytoremediation of polluted spheres of the environment on the content of toxic heavy metals, explain the factors for improving the efficiency of the process, and the conditions of phytoremediation. assess the advantages and disadvantages of phytoremediation, apply experimental phytoremediation		

	to reduce soil pollution, and analyze and apply legislation in the field of environmental protection.
Teaching methodology:	Lectures (oral presentation of teachers - presentations) and laboratory exercises (practical work)
Assessment methods and grading system¹:	Grading criteria
	Criteria Maximal score Required score
	1. Class attendance 5 3
	2. Class activities* 15 8
	3. Midterms 40 22
	4. Final exam 40 22
	Total 100 55
	* Class activity is scored through the engagement of students in exercises.
	Scores and grading
	Score Grade (B&H) Grade (ECTS)
< 55 5 F, FX	
55-64 6 E	
65-74 7 D	
75-84 8 C	
85-94 9 B	
95-100 10 A	
Literature²:	<p>Supplementary literature:</p> <ol style="list-style-type: none"> 1. Willey N. Phytoremediation Methods and Reviews. Humana Press; 2007. 2. Macek T, Dowling D, Mackova M, editors. Phytoremediation and Rhizoremediation. Springer Verlag; 2006. 3. McCutcheon SC, Schnoor JL, editors. Phytoremediation: Transformation and Control of Contaminants. John Wiley and Sons; 2003.

¹ The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

² The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton