

Study program : ECOLOGY				
Type and level of studies: Master academy study – II level of studies				
Course unit: Plants indicators of soil properties				
Teacher in charge : Gorica Djelic, PhD				
Language of instruction: English				
ECTS: 6				
Prerequisites: /				
Semester : Summer Semester				
Course unit objective Acquisition of basic knowledge about the land and its impact on growth, development and distribution of plant species. Developing the ability of the field survey , control laboratory and field methods for determining the properties of the soil and the plants that grow on it.				
Learning outcomes of Course unit The student's ability to self- apply acquired knowledge in practice. Developing critical view and understanding of phenomena and processes occurring in the soil in a sustainable development. Competence students to examine the interconnectivity and interdependence of soil properties and the plants that grow on it				
Course unit contents <i>Theoretical classes</i> Introduction: General environmental characteristics of the lithosphere (igneous , sedimentary and metamorphic rocks); General ecological effects and soil properties (morphology , physical and chemical properties of soils). Significance of bioelements (N, P, Ca , Mg , K, Fe , Mn , Zn , Cu, etc.) and heavy metals in plant growth and development . Plants indicators of pH reaction of the soil . Plants indicators of the presence of calcium in the soil. Serpentinophyta . Vicar species. Hasmophyte. Halophytes. Psamofite. <i>Practical classes</i> Practical classes are implemented field and laboratory . Field exercises include reconnaissance , taking samples of soil , collecting plants indicators of soil properties . The determination of the collected plant material and sorting into appropriate groups . Laboratory determination of physical, chemical and biological properties of the soil.				
Literature <ol style="list-style-type: none"> 1. Broadley R.M., Philip J. White J.P., John P. Hammond P.J., Ivan Zelko, I., Lux,A. Zinc in plants, Review, New Phytologist, 677-696, 2006. 2. Stankovic D., Nikolic M.S., Krstic B., Vilotic D.: Heavy metals in the leaves of tree species <i>Paulownia elongate</i> S.Y.Hu in the region of the city of Belgrade, Biotechnol. & Biotechnol. Eq. 23/2009/3, 1330-1337, 2009. 3. Đelić G., Marković A., Petković B.: <i>Variation in Verbascum phoeniceum L. seeds grown on the different type of soils</i>, Kg. J.Sci, 26, 91-102.2004 4. Jakovljević K., Lakušić D., Vukojičić S., Tomović G., Šinžar-Sekulić J., Stevanović V.: Richness and diversity of Pontic flora on serpentine of Serbia, Cent. Eur. J. Biol. 6(2) , 260-274, 2011 5. Majeti Narasimha Vara Prasad, Helena Maria de Oliveira Freitas, Metal hyperaccumulation in plants - Biodiversity prospecting for phytoremediation technology, Review article, Electronic Journal of biotechnology Vol.6 No.3, 2003. 6. Servilia Oancea, S., Foca N., Airinei A.: Effects of heavy metals on plant growth and photosynthetic activity, ANALELE ȘTIINȚIFICE ALE UNIVERSITĂȚII “AL. I. CUZA” IAȘI,2005 7. Tangahu V.B., Sheikh Abdullah S.R., Basri H., Idris M., Anuar N., Mukhlisin M.: A Review Heavy Metals (As, Pb, and Hg) Uptake by Plants through Phytoremediation, Review Article,- Hindawi Publishing Corporation International Journal of Chemical Engineering Volume 2011, Article ID 939161, 31 pages,2011. 8. Tatić B., Veljović V. : Distribution of serpentinitized massives on the Balkan peninsula and their ecology, Knowler Academic Publishers, 1991. 9. Vasić O., Diklić N.: The flora and vegetation on serpentinites in Serbia - a review. -Bocconea 13: 151-164. 2001. 10. Zeinolabedin Jouyban, Z.: The Effects of Salt stress on plant growth, Technical Journal of Engineering and Applied Sciences 2-1/7-10, 2012. 11. Zhang H., and Yanming Zhao Y., Effects of different neutral and alkaline salinities on seed germination and early seedling growth of maize (<i>Zea mays</i> L.), African Journal of Agricultural Research Vol. 6(15), pp. 3515-3521, 2011. 				
Number of active teaching hours				Other classes
Lectures:	Practice:	Other forms of classes: mentoring (consultative) system	Independent work:	
Teaching methods				

Theoretical, practical (lab) and field classes, seminars			
Examination methods (maximum 100 points)			
Exam prerequisites	No. of points:	Final exam	No. of points:
Student's activity during lectures		oral examination	50
practical classes/tests		written examination	20
Seminars/homework	30		
Other			
Grading system			
Grade	No. of points	Description	
10	91-100	Excellent	
9	81-90	Exceptionally good	
8	71-80	Very good	
7	61-70	Good	
6	51-60	Passing	
5	< 50	Failing	