

Course Unit Descriptor

Study Programme: Agronomy			
Course Unit Title: Trace elements cycling in the environment			
Course Unit Code: ZDAIZ086			
Name of Lecturer(s): Manojlović, S., Maja			
Type and Level of Studies: Doctoral studies			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Winter			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning):			
Number of ECTS Allocated: 10			
Prerequisites:			
Course Aims: Acquiring advanced knowledge of the cycles of trace elements in the environment.			
Learning Outcomes: Students will be able to apply their knowledge in the planning agricultural production system on the principles of sustainable agriculture, as well as in advisory services for agricultural production.			
Syllabus: <i>Theory:</i> Trace elements sources, origin-geochemical and anthropogenic; quantities; forms. Essential and toxic trace elements. Soil: Biogeochemical processes of essential and harmful trace elements, the distribution in the soil profile. Fertilizer: The content of trace elements, depending on the type of fertilizer and the origin of raw materials; allowed trace element and toxic elements in the raw materials and fertilizers (legislation). The accumulation of toxic elements in the soil due to the application of fertilizers. The importance of trace elements in the food chain, deficiency and toxicity, antagonism with other elements. Plant: The content of trace elements in plants originating from soil and fertilizer. Measures to prevent the accumulation of trace elements in the soil and in plants. <i>Practice:</i> Chemical methods for soil and fertilizer testing. Determination of total content of trace elements in soils, fertilizers and plants. Determination of bioavailable concentrations of trace elements in soil and fertilizers.			
Required Reading: 1. Soil fertility and fertilizers, Havlin J.L. et al., Pearson education, Inc. Upper Saddle River, New Jersey, 2005. 2. Nutrient management legislation in European countries, ed. P.De Clercq et al. WageningenPers, The Netherlands, 2001. 3. Singh BR, McLaughlin, MJ, Brevik E (eds) (2017) The Nexus of Soils, Plants, Animals and Human Health- Catena-Schweizerbart, Stuttgart, 87-98.			
Weekly Contact Hours:	Lectures: 4	Practical work: 0	
Teaching Methods: Classes are conducted with the use of modern technology (computer, video beam). Laboratory studies.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Active class participation		written exam	
Practical work		oral exam	50
Preliminary exam(s)		
Seminar(s)	50		