Course Unit Descriptor

Study Programme: Soil, plant and genetics. Modul: Soil and plant nutrition

Course Unit Title: Nutrients cycling in the environment

Course Unit Code: 19.ZB1010

Name of Lecturer(s): Manojlović, S., Maja

Type and Level of Studies: Master 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: 5

Prerequisites:

Course Aims:

Acquiring advanced knowledge of the cycles of nutrients 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:

Theory: Nutrients sources, origin-geochemical and anthropogenic; quantities; forms. Carbon cycle: organic matter in the soil, greenhouse gas emissions, measures for increasing the content of organic matter in the soil. Nitrogen cycle with special emphasis on gaseous losses, migration and rinsing of nitrates and pollution of soil and water. A phosphorus cycle with a special emphasis on phosphorus loss by washing, and eutrophication of water. Potassium. Cycles of secondary essential macroelements (sulfur, calcium, magnesium), S / Se, Ca / Mg, K / Mg, Ca / K + Mg ratio. Cycles of microelements (boron, copper, zinc, manganese, molybdenum, cobalt, selenium). Significance of microelements in the food chain, lack and toxicity, antagonisms with other elements. Legislation.
Practice: Chemical methods for soil and fertilizer testing. The importance of long-term stationary field observations. Laboratory exercises: Determination of total content of elements in soil and plant, accessible content and fractions of individual elements.

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:** 2	**Practical work:** 2

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		