

Study Programme: Agricultural Economics		
Course Unit Title: Soil Fertility, Plant Nutrition and Fertilization		
Course Unit Code: 3OAE1001		
Name of Lecturer(s): Full professor Ivana V. Maksimović, Assistant professor Ranko R. Čabilovski, Assistant professor Marina Putnik Delić, Teaching assistant Klara K. Marjanušić, Teaching assistant Milena Rajić		
Type and Level of Studies: Bachelor studies		
Course Status (compulsory/elective): Compulsori		
Semester (winter/summer): Winter		
Language of instruction: English		
Mode of course unit delivery (face-to-face/distance learning): face to face		
Number of ECTS Allocated: 6		
Prerequisites: None		
Course Aims: Gaining basic knowledge about soil fertility and fertilization. Students need to gain basic knowledge about organisms of higher plants and the influence of ecological factors on physiological processes. Particular attention is paid to mineral nutrition of plants and the importance of elements necessary for plants' metabolism and yield.		
Learning Outcomes: Students will be able to apply their knowledge about soil fertility and fertilization in agricultural production. Due to their insight into the basis of physiological processes of higher plants and the influence of abiotic and biotic factors on these, students should realize the importance of proper mineral nutrition in plant production and apply that knowledge in practice.		
Syllabus: <i>Theory</i> Introduction. Soil fertility and the necessity of fertilization. Nitrogen in soil. Phosphorus in soil. Potassium in soil. Other necessary macroelements. Beneficial elements. Microelements in soil. Soil characteristics and processes related to plant nutrition and fertilization. Fertilizers, necessity, task, classification. Nitrogen, phosphorus and potassium fertilizers. Complex fertilizers. Organic mineral fertilizers. Liquid fertilizers. Fertilizers containing pesticides and microelements. Organic fertilizers. Fertilization principles. Introduction, importance and basics of plant structure. Plant composition. Water processes in plants. Mineral nutrition of plants (elements in plants and their classification, element absorption and transport, importance of some elements in plants' life processes, mineral elements and yield). Photosynthesis. Plant respiration. Plant growth and development. Plant resistance to unfavourable environmental factors. <i>Practice</i> Soil fertility. Establishing fertilization necessity. Soil fertility and fertilization control system. Soil sampling. Determining total and mineral nitrogen in soil. N-min method. Determining easily accessible phosphorus and potassium in soil. Field experiments. Fertilizers' characteristics. Determination of active matter in fertilizers. Regulations related to fertilizers and soil enhancers. Keeping, packing and storing fertilizers. Principles of fertilizer dosing. Determining free and hygroscopic moisture in plant material; refractometric determination of dry matter percentage, determination of stomata density. Mineral nutrition: assessment of the contents of organic matter and ash, potassium, calcium and phosphorus in plant material. Photosynthesis: assessment of concentration of photosynthetic pigments and their chromatographic separation.		
Required Reading: Taiz L, Zeiger E, Møller IM, Murphy A (2014) Plant Physiology and Development, Sixth Edition, Sinauer Associates. Havlin J.L.. (2005): Soil fertility and fertilizers. Pearson education, Inc. Upper Saddle River, New Jersey 07458.		
Weekly Contact Hours: 5	Lectures: 45	Practical work: 30

Teaching Methods:

Lectures, Practice/ Tutorials

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation	8 (4+4)	written exam	60 (24+36)
Practical work		oral exam	
Preliminary exam(s)	32 (12+20)	
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.