

<b>Study Programme:</b> Soil Science and Plant Nutrition
<b>Course Unit Title:</b> Crop Nutrition
<b>Course Unit Code:</b> 3MZI1002
<b>Name of Lecturer(s):</b> Full professor Ivana Maksimović, Full professor Maja S. Manojloić, Assistant professor Marina Putnik-Delić, Assistant professor Ranko R. Čabilovski
<b>Type and Level of Studies:</b> Master Academic Studies
<b>Course Status (compulsory/elective):</b> Compulsory
<b>Semester (winter/summer):</b> Winter
<b>Language of instruction:</b> English
<b>Mode of course unit delivery (face-to-face/distance learning):</b> Face to face
<b>Number of ECTS Allocated:</b> 5
<b>Prerequisites:</b> Passed exam Plant physiology at the BSc level
<p><b>Course Aims:</b></p> <p>Acquisition of advanced knowledge in the field of plant nutrition, with special emphasis on issues which are expected to be applied in research and agricultural practice</p>
<p><b>Learning Outcomes:</b></p> <p>Students who successfully complete the course "Crop nutrition" are qualified to follow the contemporary literature on the subject and to apply new knowledge in their future carrier.</p>
<p><b>Syllabus:</b></p> <p><i>Theory</i></p> <p>Introduction, Definition and classification of plant nutrients, Mechanisms of ion uptake by individual plant cells and root system as a whole, Influence of environmental factors nutrient uptake. Transport of nutrients by xylem and phloem and regulation of transport processes, Uptake and leaking of mineral elements through leaves and other above-ground plant parts, Yield and source-sink relations with respect to photosynthesis, Mineral nutrition and yield, Role of macronutrients, Role of micronutrients, Role of non-essential elements, Relations between plant mineral nutrition and plant diseases and pests, Diagnosis of deficiencies and toxicities of mineral elements, Effects of environmental and internal factors on root system development, Effect of rhizosphere on plant mineral nutrition, Adaptation of plants to unfavorable soil conditions, Impact of mineral nutrition on disease incidence and development.</p> <p><i>Practice</i></p> <p>Determination of nitrogen and nitrate content in plants, Determination of nitrate reductase activity in plants with different nitrogen nutrition regimes, Determination of P, S, K and Ca concentrations in plant tissues, Determination of micronutrient content in plant tissues by AAS, Growing plants in semi-controlled conditions, Provoking and observation of deficiency/excess of different elements, Study of the effects of various factors on plant mineral nutrition. Case studies of situations that happen during crop vegetation (crops selected according to projects that students do for their master thesis), discussions. Possibly visits to fields, collecting plant material and analysis of that material – if and to an extent to which this is possible.</p>
<p><b>Required Reading:</b></p> <p>Barker AV, Pilbeam DJ (eds), Handbook of Plant Nutrition. Taylor and Francis, 2007</p> <p>Taiz L, Zeiger E, Møller IM, Murphy A (2014) Plant Physiology and Development, Sixth Edition, Sinauer Associates.</p> <p>Havlin J.L.. (2005): Soil fertility and fertilizers. Pearson education, Inc. Upper Saddle River, New Jersey 07458.</p>

<b>Weekly Contact Hours:</b> 5	<b>Lectures:</b> 45	<b>Practical work:</b> 30	
<b>Teaching Methods:</b> Lectures, Practical classes, Consultations, study, research work			
<b>Knowledge Assessment (maximum of 100 points):</b>			
<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation	10	written exam	
Practical work	10	oral exam	60
Preliminary exam(s)	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.			