COURSE DESCRIPTION

Course code	Volume in ECTS credits	Institution	Faculty	Department
8006	7	VMU, Agriculture Academy	Agronomy	Agroecosystems and Soil Science

Course title in Lithuanian

Augalų mityba

Course title in English

Plant nutrition	
Study methods	**Volume in ECTS credits**
Lectures	2
Consultations	1
Seminars	
Individual work	4

Short course annotation in Lithuanian (up to 500 characters)

Dalyko paskirtis – supažindinti doktorantus su augalų mitybos mokslo perspektyvomis, augalų produktyvumo ir derliaus kokybės formavimo ypatumais natūralių ir antropogeninių veiksnių poveikyje, skirtingų tręšimo sistemų dėsningumais ir jų tobulinimo galimybėmis, augalų mitybos lygio bei pasekmių augalui ir aplinkai prognozavimo galimybėmis.

Short course annotation in English (up to 500 characters)

The aim of the subject is to introduce PhD students with perspectives of the plant nutrition science, peculiarities of plant productivity and yield quality formation with regard to natural and anthropogenic factors, regularities of the various fertilization systems and their development options, predictability possibilities of plant nutrition level and impact on plants as well as environment.

Relevance of the course

After the course students will have enough knowledge and skills to plant and perform the fundamental and applicable plant nutrition research, to process the obtained results and with regard to it to frame new knowledge and ideas; with reference to the results of novel carried fundamental and applicable scientific research to analyse the changes in soil properties and plant yield formation, to design and manage plant nutrition processes and to introduce strategic technological solutions for environmental pollution.

Course aims

To develop the system of knowledge, skills, abilities that assure complex assessment and management of plant nutrition processes.

Content (topics) and methods

Topic 1. Development of agrochemistry science (Greek philosophers, ancient Romans, medieval thinkers, development of agrochemistry in 18^{th} –19^{th}, 20^{th} and 21^{st} centuries. Topic 2. Soil composition, characteristics (agrochemical, physical, biological), regimes (moisture, air, thermal). Soil fertility, its regulation. Importance of soil fertility for plant nutrition, quality of soil, water and environment. Topic 3. The regime of organic matter and mineral nutrition elements and transformation in soil. Topic 4. Transformation of carbon compounds in plants. Role of oxygen in the transformation of plant organic matter. Topic 5. Importance of macro, meso and micro elements in plant nutrition and their forms in plants. Topic 6. Organic and mineral fertilizers and their transformation in soil. Topic 7. Nutritional regulation of plant productivity under regular and stress conditions. Topic 8. Plant nutrition and diseases. Topic 9. Spectrometric, morphobiometric and visual detection of plant nutrition.

Topic 10. Theoretical, biological and economic reasoning of forms, norms and time selection of fertilizers. Topic 11. Fertilizing systems (extensive, intensive, precision) and their impact on the environment.

Structure of cumulative score and value of its constituent parts

Homework - 40%; Final exam - 60 %.

Compulsory reference materials

No.	**Authors of publication, title, publishing house, year of publication.**
1.	Fernandez V., Sotiropoulos T., Brown P. Foliar fertilization. Scientific principles. International fertiliezer industry association, 2013. –144 p.
2.	Lawrence E. Datnoff, Wade H. Elmer, Don M. Huber (edit.) Mineral nutrition and plant disease. American Phytopathological Society, 2007. –278 p.
3.	Marschner's P. Mineral Nutrition of Higher Plants. Academic Press is an imprint of Elsevier, 2010. –642 p.
4.	Pessarakli M. Handbook of Plant and Crop Stress (third edition). Taylor and Francis group, London, 2011. – 713 p.
5.	Šlapakauskas V., Kučinskas J. Augalų mityba. Akademija, 2008. – 298 p.
6.	Tripolskaja L., Mašauskas V., Adomaitis T. ir kt. Agroekosistemų komponentų valdymas. Akademija, 2010. –567 p.

Supplementary reference materials

No.	**Authors of publication, title, publishing house, year of publication.**
1.	Dris R. Plant nutrition :growth and diagnosis. Science Publishers, 2002. –303 p.
2.	Kirkby E. A. Principles of plant nutrition. Dordrecht : Kluwer Academic, 2001. –849 p.
3.	Šlapakauskas V., Duchovskis P. Augalų produktyvumas: [vadovėlis]. Akademija, 2007. – 253 p.
4.	Šlapakauskas V. Augalų ekofiziologija. Mineralinė mityba. Kaunas-Akademija, 2001. –134 p.
5.	Tripolskaja L. Organinės trąšos ir jų poveikis aplinkai: [monografija]. Akademija, 2005. – 214 p.

Course programme designed by

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