COURSE "CROP ECOLOGY" DESCRIPTION

Course code	Volume in ECTS credits	Institution	Faculty	Institute
AGR8008	7	Vytautas Magnus University	Faculty of Agronomy	Institute of Agroecosystems and Soil Sciences

Course title in Lithuanian

Pasėlių ekologija

Course title in English

Crop ecology

Study methods	Volume in ECTS credits
Lectures	1.5
Consultations	0.2
Seminars	0.3
Individual work	5.0

Short course annotation in Lithuanian (up to 500 characters)

Studijuodami dalyką „Pasėlių ekologija" doktorantai įgyja žinių apie agrofitocenologijos raidos istorinius matmenis, laukų augalinės dangos ypatumus ir savybes, dirbamų žemių augalų bendrijų (agrofitocenozių) savybes, struktūrą, funkcionavimą, savitvarką, dinamiką, stabilumą, klasifikavimą ir pasiskirstymo dėsningumus, Lietuvos segetalinių ir ruderalinių bendrijų įvairovę.

Short course annotation in English (up to 500 characters)

PhD students studying the course "Crop ecology" acquire knowledge about the historical dimensions of the development of agrophytocenology, peculiarities and properties of the field plant cover, the arable land plant communities (agrophytocenoses) properties, structure, function, dynamics, classification, distribution patterns, the diversity of Lithuanian segetal and ruderal communities.

Relevance of the course

The course helps for PhD students to carry out research of plant communities (agrophytocenoses), to assess crop communities under the conditions of different farming systems and soil types, to compound field weed cartograms and maps of field plant cover (geobotanical maps).

<u>Course aims</u>

The aim of the course is to provide PhD students with knowledge about crop as part of the ecosystem and landscape, characteristics, structure, functioning, dynamics, classification and distribution patterns of plant communities (agrophytocenoses), human (anthropogenic) influence on the field plant cover, agricultural plant communities diversity.

Content (topics) and methods

Subject content:

Introduction to geobotany. Definition of geobotany. The concept of flora and vegetation. Spontaneous and sinantropic flora. The begining of agriculture. Cultural plants and weeds. Centres of origin of cultural plants. Geographical distribution of plants: ways, aerials and their grouping. Floral elements: geographic, genetic, historical and migratory. Human influence on plant cover or sinantropisation. Classification of sinantropic plants. The ability of plants to adapt to environmental conditions consists of many ecological factors. Concepts of place, habitat, ecotype, biotope. Complexes of ecological conditions: climate, edaphic, orographic and biotic. Definitions of modifications and ecotypes. Plant ecological groups. Plant life forms or bimorphs. Plants indices.
Fundamentals of general phytocenology. Understanding the plant community or phytocenosis.

Continuity. Biocenosis, biogeocenosis, ecosystem. Organization of phytocenoses: species composition, populations and cenopopulations, vertical, horizontal and temporal structures, synonyms. Classification of phytocenoses. Concept of syntax. Phytocenosis taxonomic categories. Association – the main unit of classification of communities. Science about community ecology or synecology. Phytosphere, rhizosphere. Phytocenosis change – succession, climax. Regular patterns of phytocenosis distribution in the land.

Agrophytocenology is a branch of special phytocenology. Definition of agrophytocenology. Historical dimensions of the development of agrophytocenology. The world's most famous agrophytocenologists and their works. Geobotanical concept of the field. Clasifying of field plant cover into crops and unusable plants – segetal and ruderal communities. Agroecosystem. Agrophytocenosis – integral part of the agroecosystem. Species composition of agrofitocenoses. Cenopopulations and their composition. Classification of agrophytocenosis cultural component individuals by age of maturity (ontogenesis). Abundance of species individuals (cenopopulations) and methods for its detection. Population density, its dependence on seed content and other agrotechnical tools. Density of weed populations and factors affecting it. Bank of diasporas. Vertical and horizontal structure of agrophytocenosis. Homogeneity of cenopopulations. Homogeneity indices and detection methods. Temporal structure of agrophytocenosis. Community phenological spectrum, phenological aspects. The concept of sinusia. Influence of ecological factors on agrophytocenosis. Ecological types of crop plants and their indicative value. Plant relationships in agrophytocenosis. Critical period of weed competition for cultural plants. Threshold of weed harmfulness (threshold). Productivity of agrophytocenoses. Functioning, self-regulation, dynamics and stability of agrophytocenosis. Agrophytocenology and agriculture. The importance of agrophytocenology for organic agriculture. Classification of agrophytocenoses: distinctive features of agrophytocenosis, classification systems and methods. Diversity of Lithuanian segetal and ruderal communities. Community indicative properties. Field weed cartograms. Maps of field plant cover (geobotanical maps).

Learning methods:

The lecture, lecture with discussion, report, individual task (analysis of x agrophytocenosis scientific research data), brainstorming.

Structure of cumulative score and value of its constituent parts

A ten-point criterion-based scale and cumulative assessment system is being applied.
Framework of cumulative assessment:
Report – 15 % (6-7 week after report theme performance);
Individual task – 15 % (10 week after individual task performance);
Examination – 70 % (17-20 week).

Compulsory reference materials

No.	Authors of publication, title, publishing house, year of publication.
1.	Juknys R. Environment research: handbook. Kaunas, Publishing of VMU, 2005. 334 p.
2.	Loomis R. S., Connor D. J. Crop ecology. Productivity and management in the agricultural systems. Cambridge University Press, 1996. 538 p.
3.	Marozas V. Terrestrial ecosystems diversity and protection: handbook. Klaipėda, IDP Solutions, 2008. 112 p.
4.	Natkevičaitė-Ivanauskienė M. Botanical geography and basics of phytocoenology. Vilnius, Publishing of Science, 1983. 280 p.
5.	Pilipavičius V., Pupalienė R., Marcinkevičienė A. Crop communities and their investigations: study book. Klaipėda, IDP Solutions, 2008. 112 p.

Supplementary reference materials

No.	Authors of publication, title, publishing house, year of publication.
1.	Bučienė A. Ecological relationships of the farming systems: monograph. Klaipėda, Publishing of LKU, 2003. 176 p.
2.	Čiuberkis S., Vilkonis K. K. Weeds in the Lithuanian agroecosystems: monograph. Akademija, Kėdainių distr., 2013. 256 p.
3.	Gudžinskas Z. et al. Invasive organisms of Lithuanian and Latvian border region. Vilnius, Publishing of BMK, 2014. 181 p.
4.	Peart R. M., Shoup D. W. Agricultural systems management: optimizing efficiency and performance. New York, NY, Basel, Marcel Dekker, 2004. 280 p.
5.	Rašomavičius V. Inventory guide of EU importance natural habitats. Vilnius, 2012. 474 p.
6.	Sieglinde S., Pound B., Mass B. Agricultural systems: agroecology and rural innovation for development. Elsevier Academic Press, 2008. 386 p.
7.	Zacharenko A. V. Theoretical basics of agrophytocenoses weed control in the farming systems. Moscow, 2000. 466 p.

Course programme designed by

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Approval at the Institute:

Approval at the program doctoral committee:

Course description valid until: