COURSE DESCRIPTION

Course code	Volume in ECTS credits	Institution	Faculty	Department
AGR8012	7	VMU Agriculture Academy	Agronomy	Institute of Biology and Plant Biotechnology

Course title in Lithuanian

Lauko augalų selekcija ir sėklininkystė

Course title in English

Crop breeding and seed production

Study methods	Volume in ECTS credits
Lectures	1
Consultations	1
Seminars	2
Individual work	3

Short course annotation in Lithuanian (up to 500 characters)

Šio dalyko studijose analizuojami lauko augalų selekcijos pagrindiniai principai genetiniu aspektu. Studentai supažindinami su tradiciniais ir moderniais selekcijos metodais; aptariamos perspektyvių selekcinių programų realizavimo problemos. Studijuojant šį dalyką, aptariami selekcinio darbo organizavimo principai, veislių tyrimo aspektai. Studentai supažindinami su moksliniais - metodiniais sėklininkystės pagrindais.

Studijų formos: paskaitos, seminarai, konsultacijos, savarankiškas studento darbas ir baigiamasis egzaminas.

Short course annotation in English (up to 500 characters)

During the studies are analyzed the basic principles of crop breeding from a genetic point of view. Students are introduced to traditional and modern plant breeding methods; problems of realization of viable breeding programs are discussed. While studying this subject, the principles of organizing the breeding work, the aspects of the varieties research are discussed. Students are introduced to the scientific - methodological basis of seed production.

This course of the program in evaluated through the examinations, which includes lectures, seminars, consultations, student's individual work, and final exam.

Relevance of the course

The subject belongs to a group of optional specialty subjects. After completing the course students will acquire the latest scientific knowledge about modeling varieties of high genetic potential, development and realization of promising breeding programs, about using of analytical and synthetic breeding, genetic methods, organization of breeding work; students will be able to analyze, independently solve problems of increasing plant genetic potential, plan and carry out fundamental and applied plant breeding research.

Course aims

The aim of this course is to develop the knowledge and skills of doctoral students, ensuring their competencies in the development and implementation of plant breeding programs in practical activities, solutions of variety modeling problems, management and implementation of breeding methods in the field of plant breeding and seed production.

- 1. Phytogeographic Differentiation the Basis of Plant Breeding.
- 2. Genetic Basics of Field Plant Breeding
- 3. The Main Principles of New Varieties Development.
- 4. The Plant Breeding Methods.
- 5. Intravarietal, Interspecific Hybridization.
- 6. Use of Heterosis in Breeding.
- 7. Mutations in Plant Breeding.
- 8. Use of Polyploidy, Haploidy in Pant Breeding.
- 9. *In vitro* technology in Plant Breeding
- 10. Biometric and Genetic Analysis in Plant Breeding.
- 11. The Most Important Directions of Breeding Work.
- 12. Evaluation of Breeding Material and Organization of Breeding Work.
- 13. Research, Realization and Protection of Varieties.
- 14. Scientific Methodological Foundations of Plant Seed Production.

Seminars: targeted readings of the main Lithuanian legal acts and normative documents (in the field of plant genetic resources, biodiversity conservation, GMO, plant variety protection, seed production).

Individual work: presentation of scientific literature analysis (in the field of plant breeding). *Learning methods*: Explanatory-demonstration method, target reading, discussion.

The lecturer does not read lectures if the number of students is minimal. The teacher advises the students according to his schedule.

Structure of cumulative score and value of its constituent parts

Individual work - 50%; Final exam - 50%.

Compulsory reference materials

No.	Authors of publication, title, publishing house, year of publication.				
1.	Rančelis, V. Augalų genetika. Kaunas: Technologija, 2008.				
2.	Ruzgas, V. Augalų selekcija. Kaunas: LŽŪU, 2009.				
3.	Acquaah, G. Principles of Plant Genetics and Breeding. Blackwell Publishing, 2nd. ed. 2012.				
	http://gtu.ge/Agro-Lib/Principles%20of%20Plant%20Genetics%20and%20Breeding.pdf				
4.	Bradshaw, J. E. Plant Breeding: Past, Present and Future. Springer International Publishing, 2016.				
	https://www.springer.com/la/book/9783319232843				
5.	Bos, I., Caligari, P. Selection Methods in Plant Breeding. Springer International Publishing, 2008.				
	https://www.springer.com/la/book/9781402063695				
6.	Céron-Rojas, J. J., Crossa, J. Linear Selection Indices in Modern Plant Breeding. Switzerland:				
	Springer International Publishing, 2018. https://www.springer.com/la/book/9783319912226				
Supplementary reference materials					
No.	Authors of publication, title, publishing house, year of publication.				
1.	Sliesaravičius, A. ir kt. Žemės ūkio augalų selekcijos ir sėklininkystės terminų žodynas. Vilnius.				
	2010.				
2.	Varshney, R.K., Roorkiwal, M., Sorrells, M.E. (Eds.). Genomic Selection for Crop Improvement.				
	Springer International Publishing, 2017. https://www.springer.com/gp/book/9783319631684				
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Course programme designed by

Sourse programme designed by							
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Approval at the Institute of Biology and Plant Biotechnology, 2019 04 09, protocol No. 22 Approval at the doctoral committee Course description valid until: