

Study Programme: Agronomy		
Course Unit Title: Genomic selection of animals		
Course Unit Code: IP1		
Name of Lecturer(s): Full professor Snežana Trivunović, associate professor Ljuba Štrbac		
Type and Level of Studies: Doctoral academic studies		
Course Status (compulsory/elective): Elective		
Semester (winter/summer): Winter		
Language of instruction: Serbian, but individual consultations and materials are offered to incoming students in English		
Mode of course unit delivery (face-to-face/distance learning): face-to-face		
Number of ECTS Allocated: 7		
Prerequisites: None		
Course Aims: Acquiring knowledge about the principles of genomic selection of animals, which includes introducing students to the methods for genotyping animals, and then to the methods of processing the obtained data using mathematical analysis and practical application of the obtained results in the implementation of breeding programs.		
Learning Outcomes: Students will be able to apply the obtained results of the estimation genomic breeding values of domestic animals in the implementation of breeding programs. In the course of teaching activities, students will learn about genotyping, how to correctly interpret the results of genomic analysis, and then apply the results in the implementation of breeding programs.		
Syllabus: <i>Theory</i> Genetic markers and genotyping methodology. Polymorphism of single nucleotide positions - SNP. The basic strategy of marker-assisted selection. Detection and validation of nucleotide quantitative traits. Genomic assessment of breeding values. Genomic evaluation based on analysis of production results. Selection of a statistical model for genomic evaluation. Software and tools for data processing. The use of genomic selection in breeding programs. Economic evaluation of the application of genomic selection in breeding programs. <i>Practice</i> Criteria for evaluation of estimated genetic values. Methods used to validate genomic estimates. Selection of a statistical model for genomic evaluation. Software and tools for data processing. Evaluation of real-world data-based methodologies for dairy cows. Evaluation of methodologies based on real data in poultry farming. Evaluation of methodologies based on real data in pig farming.		
Required Reading: 1. Weller J. I. (2016): Genomic Selection in Animals, Wiley-Blackwell 2. Womack J. (2012): Bovine genomics, John Wiley & Sons 3. Mihajla Đan, Nevena Veličković (2017): Molekularni markeri u populacionoj genetici, Faculty of Science, Novi Sad 4. Bhanu P. Chowdhary (2003): Animal Genomics, Karger 5. Khatib X. (2015): Molecular and Quantitative Animal Genetics, John Wiley & Sons 6. Ruvinsky A., Marshall Graves J. A. (2004): Mammalian Genomics, CABI.		
Weekly Contact Hours:	Lectures: 3	Practical work: 5
Teaching Methods:		

The theoretical part of the teaching is conducted in the form of lectures with the use of presentations and consultations. The practical part of the teaching is carried out in the laboratory for molecular genetics and in the computer laboratory with the application of modern data processing software.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation	-	written exam	-
Practical work	-	oral exam	50
Preliminary exam(s)	-	
Seminar(s)	50		

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