

Study program: Organic crop and livestock production			
Type and level of study: Bachelor academic studies			
Course Title: POPULATION GENETICS OF DOMESTIC AND CULTIVATED ANIMALS			
Professors: Dr. Slađan Rašić, Assistant Professor			
Status: Optional 2, semester VI			
ECTS 7			
Prerequisite: None			
The goal of the course To enable students to acquaint with and understand basics of inherited and environmental factors of the variability of quantitative traits in domestic animals and basic genetic parameters, and practically apply them in assessing the breeding value and selection effect, routes and methods of breeding and selection, the importance of linear model in breeding domestic animals, with the use of appropriate active teaching methods and the use of modern learning resources.			
The outcome of the course At the end of the course the students should explain the concept and characteristics of the population of domestic animals and cultivated; classify and describe the factors of change in genotype frequencies in population; summarize and explain the influence of genotype and environmental factors on the phenotypic variability of quantitative traits in domestic animals; using different methods of assessment heritability (heritability), repeatability and connection properties. Also, the students should master the application of appropriate methods of selection and assessment of the progress of selection (selection effect), calculation of the coefficient of relationship and inbreeding in the population, estimation of breeding values of domestic animals, application of the principles and methods of population genetics and breeding of domestic animals in the practical and scientific research.			
Syllabus <i>Theoretical study</i> – Genetic structure of the population. Continual variation. Basics of analysis of variance and covariance. Additive, epistatic dominant gene effect. The heritability, repeatability and correlations. Basic principles, methods and effect selection. Assessment methods of breeding value. Relationship and inbreeding. Crossing and heterosis. Directions of breeding of domestic animals and cultivated. The importance of linear method in the breeding of domestic animals and cultivated. Application of new methods in breeding animals (QTL and genomic selection) <i>Practical lessons</i> – Study research work Variability of quantitative traits. Statistical estimation of population parameters and testing hypotheses about their significance. Analysis of gene frequencies and genetic equilibrium. Calculation of genetic parameters (heritability coefficient, repeatability and correlations) and their application in breeding of domestic animals and cultivated. Determination of the coefficient of kinship and inbreeding. Calculation of the effects of changes in the selection and generation of offspring. Estimation of breeding values of individuals by using different methods and models.			
Literature 1. Bourdon, R.M. (2000): Understanding Animal Breeding, Prentice-Hall, Inc. 2. Pirchner F. (1969): Population genetic in animal breeding, W.H Freeman and co., San Francisco			
Number of lectures: 4			Other Lessons
Lectures: 2	Practices: 2	Other forms of teaching: Student research work:	
Teaching methods: Theoretical and practical lessons combined with interactive teaching and creating term papers. Planned and appropriate field trips and visits to trade fairs and centres for artificial insemination. Testing knowledge in lectures and exercises will be carried out through test			
Score (maximum 100 points)			
Pre-commitments	Points	The final exam	Points
Activity during lectures	10	Written exam	25
Practical lessons	10	Oral examination	25
Preliminary exam	15		
Seminars	15		
<i>Total</i>	50		50