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| Course: Animal Production | *Quantitative Genetics* |
| Course id: 3MCT1I19 |
| Number of ECTS: 6 |
| Teacher: | Snežana Trivunović, PhD, associate professorDragomir Lukač, MSc, teaching assistant |
| Course status | Elective |
| Number of active teaching classes (weekly) |
| Lectures: 30 | Practical classes: 30 | Other teaching types: | Study research work: | Other classes: |
| Precondition courses | None |
| 1. Educational goal

Education of students in understanding and practical application of effects and changes in the genes in populations, and the causes and factors that lead to a distortion of the balance of genes and genotypes in the population, and changes of properties and their maintenance in the generations of descendants and the evolution of species. Students will learn about the effects of genetic and non-genetic factors and their interaction in the phenotypic variability of quantitative traits. |
| 1. Educational outcomes

At the end of the course, the student should demonstrate a systematic and thorough knowledge and understanding of the laws of the genetic specificity of quantitative traits and methods used in genetic analysis of quantitative traits. The students are expected to know the state of the science in this field and to develop into independent researchers. |
| 1. Course content

*Lectures*The genetic constitution of the population (the frequency of genes and genotypes in the population). Characteristics of quantitative traits. Hardy-Weinberg law of large population. Laws of small populations. Changes in gene frequencies and genotypes in the population affected by migration, mutation and selection. Components of variability and correlation analysis. Genetic parameters of quantitative traits. The interaction of genotype and environment (causes of interaction, types of interactions). The importance of the interaction of genotype with the environment in animals breeding. Adaptive value. Effective population size. Genetic diversity based on molecular markers (detection and measurement of genetic variability) Calculation of genetic distances between individuals and populations based on molecular data. Identification of quantitative traits loci (QTL) - analysis and application in domestic animals. *Practical classes*Students will learn the basics of molecular genetics, PCR reaction, DNA isolation protocols, procedures and preparing PCR reactions, mapping and sequencing of the genome of the essays. Will introduce the basic genetic QTL databases of all kinds of domestic animals. |
| 1. Teaching methods

The theoretical part of the training is conducted with the use of presentations that are prepared so that students have a visual representation of teaching lessons. Practical classes are conducted in the laboratory of Molecular Genetics and with the use of computers and software in the field of genetics and biotechnology in animal husbandry. |
| Knowledge evaluation (maximum 100 points) |
| Pre-examination obligations | Mandatory | Points | Final exam | Mandatory | Points |
| Lecture attendance | Yes | 10 | *Written part of the exam-tasks and theory* | Yes | 20 |
| Test | Yes | 10 | *Oral part of the exam* | Yes | 30 |
| Exercise attendance | Yes | 20 |  |
| Term paper | Yes | 20 |
| Literature  |
| Ord. | Author | Title | Publisher | Year |
|  | Vidović V. | Teorija oplemenjivanja životinja | Poljoprivredni fakultet, Novi Sad | 2011 |
|  | Falconer D.S. | Quantitative genetics | Department of Genetics and Agricultural Research Council Unit of Animal Genetics, University of Edinburgh | 1960,1981 |

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| Znak univerziteta | UNIVERSITY OF NOVI SADFACULTY OF AGRICULTURE 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 8 | Znak fakulteta2 |
| Study Programme AccreditationMASTER ACADEMIC STUDIES *Animal Production* |
| Table 5.2 Course specification |