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| <b>Study Programme:</b> Veterinary medicine  |
| <b>Course Unit Title:</b> Veterinary genetics  |
| <b>Course Unit Code:</b> 19.VET018   |
| <b>Name of Lecturer(s):</b> Full professor Snežana Trivunović, associate professor Ljuba Štrbac  |
| <b>Type and Level of Studies:</b> Integrated studies   |
| <b>Course Status (compulsory/elective):</b> Compulsory   |
| <b>Semester (winter/summer):</b> Winter  |
| <b>Language of instruction:</b> Serbian, but individual consultations and materials are offered to incoming students in English  |
| <b>Mode of course unit delivery (face-to-face/distance learning):</b> face-to-face   |
| <b>Number of ECTS Allocated:</b> 4   |
| <b>Prerequisites:</b> None   |
| <p><b>Course Aims:</b></p> <p>The aim of the course is for students to acquire: 1) knowledge of the basic principles and laws of inheritance of quantitative, qualitative and threshold traits of animals, at the molecular, cytogenetic and population levels; 2) skills of application of basic molecular-genetic methods; 3) the ability to independently solve problems related to the inheritance of traits and anomalies of animals and make appropriate conclusions.</p>  |
| <p><b>Learning Outcomes:</b></p> <p>After the student passes the exam in this course, the following outcomes are expected: 1) the student will be able to briefly describe the laws of inheritance of traits and to define the causes of anomalies in domestic animals; 2) the student will be able to distinguish the principles of inheritance of quantitative and qualitative traits; 3) the student will, based on the data on the genetic constitution of the parents, know how to predict the genotype and phenotype of the offspring, calculate the coefficient of kinship and inbreeding; 4) the student will be able to determine and analyze the genotype of the animal using molecular genetic analytical methods; 5) the student will be able to explain how changes in the structure of DNA and the number and structure of chromosomes affect the formation of phenotypic changes and vitality; 6) based on the data on the genetic constitution, the student will be able to choose which animals should be kept, and which should be excluded from further breeding.</p> |
| <p><b>Syllabus:</b></p> <p><i>Theory</i></p> <p>Cell and chromosome structure. Cell cycle. Gene structure and function. Mendel's laws of inheritance. Deviations from Mendel's inheritance principles. Multiple alleles and gene interaction. Linked genes and Crossing-over. Sex determination and sex-linked traits. Gene mutations. Structural and numerical chromosome aberrations. Inheritance of quantitative traits. Population genetics. Genetic engineering. Evolutionary genetics. Inheritance of anomalies, diseases, and disease resistance.</p> <p><i>Practice</i></p> <p>Cell and chromosome structure. Structure and function of genetic material. Mendel's laws of inheritance. Cell division. Creation and determination of gametes. Deviations from Mendel's inheritance principles. Multiple alleles and gene interaction. Linked genes and crossing-over. Sex determination and sex-linked traits. Structural and numerical chromosome aberrations. Probability and <math>\chi^2</math> test. Population genetics.</p>   |
| <b>Required Reading:</b>   |

1. Đelić, N., Stanimirović, Z. (2004): Principi genetike, Faculty of Veterinary Medicine, Belgrade.
2. Đedović, R. (2011): Genetika domaćih i gajenih životinja, Faculty of Agriculture, Belgrade
3. Kraljević-Balalić, M., Petrović, S., Vapa, Lj. (1991): Genetika, teorijske osnove sa zadacima, Faculty of Agriculture and Faculty of Sciences, Novi Sad
4. Tamarin, R. H. (2002): Principles of Genetics, McGraw-Hill Higher Education.

**Weekly Contact Hours:**

**Lectures: 2**

**Practical work: 2**

**Teaching Methods:**

The theoretical part of teaching is performed using presentations prepared so that students have a visual presentation of teaching units. At the end of the lecture, students present their seminar paper as an introduction to the next teaching unit. Practical classes consist of solving tasks related to the inheritance of traits and anomalies and performing laboratory genetic analyses for the purpose of determining the genotype of the animal.

**Knowledge Assessment (maximum of 100 points):**

| <b>Pre-exam obligations</b> | points | <b>Final exam</b> | points |
|-----------------------------|--------|-------------------|--------|
| Active class participation  | 6      | written exam      | 20     |
| Practical work              | 4      | oral exam         | 30     |
| Preliminary exam(s)         | 30     | .....             |        |
| Seminar(s)                  | 10     |                   |        |

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