Biotechnical Faculty / CONTINENTAL FRUIT GROWING AND MEDICAL PLANTS / AGRICULTURAL GENETICS

Course:	AGRICULTURAL GENETICS			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
8403	Mandatory	2	5	2+2+0
Programs	CONTINENTAL FRUIT GROWING AND MEDICAL PLANTS			
Prerequisites	None.			
Aims	Introduction of students to the basic principles of inheriting traits. The results of genetic research are applied in the breeding of new varieties of agricultural plants. Given that the emphasis on presenting genetic research is on its application in agriculture, we can speak of agricultural genetics (Borojević – 1976).			
Learning outcomes	After passing the exam, students will be able to: Explain the morphology, structure, and chemical composition of chromosomes, the structure of DNA and RNA, cell division, and fertilization. Define concepts such as gene, allele, locus, genotype, phenotype. Explain the division of traits based on the number of genes determining them. Select parental pairs for hybridization based on phenotype. State the basic principles and laws in the inheritance of traits in plants. Determine the mode of inheritance of traits of agronomic significance and calculate their heritability. Apply acquired knowledge in hybridization and improvement programs for fruit species.			
Lecturer / Teaching assistant	Prof. dr Đina Božović- Professor, dr Jasmina Balijagić - Associate			
Methodology	Lectures, exercises, colloquiums and final exam.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Cell and chromosome structure.			
I week exercises	Morphology and chemical composition of chromosomes.			
II week lectures	Cell division.			
II week exercises	Plant fertilization process.			
III week lectures	Independent separation of genes.			
III week exercises	Monohybrids, dihybrids, trihybrids - tasks.			
IV week lectures	Multiple alleles and gene interaction.			
IV week exercises	Multiple alleles and gene interaction (tasks). Checking experimental results (Chi-square test).			
V week lectures	Structure and function of genetic material.			
V week exercises	Structure and function of genetic material (tasks).			
VI week lectures	Linked genes and crossing over.			
VI week exercises	Calculating the percentage of single and double crossovers from test cross data and F2 generation (tasks).			
VII week lectures	Sex determination and sex-linked traits. Colloquium I.			
VII week exercises	Sex determination (tasks).			
VIII week lectures	Mutations. Colloquium I retake.			
VIII week exercises	Mutations (tasks).			
IX week lectures	Species and genus hybrids. Methods to overcome difficulties in species and genus hybridization.			
IX week exercises	Species and genus hybrids (tasks).			
X week lectures	Changes in chromosome number.			
X week exercises	Euploids and aneuploids (tasks).			
XI week lectures	Changes in chromosome structure.			
XI week exercises	Deletions, inversions, duplications and translocations (tasks).			
XII week lectures	Polygenic inheritance. Inheritance of quantitative traits.			
XII week exercises	Calculation of components of phenotypic variability and heritability of traits (tasks).			

XIII week lectures	Population Genetics. Colloquium II.
XIII week exercises	Population genetics (tasks).
XIV week lectures	Inbreeding and heterosis. Colloquium II retake.
XIV week exercises	Inbreeding and heterosis (tasks).
XV week lectures	Changes induced by transplantation.
XV week exercises	Calculating combinatorial abilities of plant traits (GCA and SCA) - tasks.
Student workload	

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises **2 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts** Total workload for the subject: **5 x 30=150 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **30 hour(s) i 0 minuts** Workload structure: **106 hour(s) i 40 minuts (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	Attendance of lectures and exercises; completion of colloquiums and the final exam.
Consultations	One hour per week, as agreed upon with the students.
Literature	Borojević, S., Borojević Katarina (1976): "Genetics." University of Novi Sad, Novi Sad. Kraljević – Balalić, Marija, Petrović, S., Vapa, Ljiljana (1991): "Genetics - theoretical foundations with problems." University of Novi Sad, Faculty of Agriculture and Natural Sciences, Novi Sad. Šurlan-Momirović, Gordana, Rakonjac, Vera, Prodanović, S., Živanović, T. (2007): "Genetics and Plant Breeding (workbook)." Faculty of Agriculture, Belgrade. Deletić, R.N. (2009): "Introduction to Molecular Genetics." University of Priština, Faculty of Agriculture, Kosovska Mitrovica- Zubin Potok.
Examination methods	Lectures attendance = 10 points; Seminar essay: 10 points; Colloquium: 2x 15 points= 30 points; Final exam = 50 points.
Special remarks	
Comment	

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points