Study Programme: Fruit science, viticulture and horticulture –module Fruit science and viticulture

Course Unit Title: Fruit breeding

Course Unit Code: 19.VI1012

Name of Lecturer(s): Goran Barać

Type and Level of Studies: Undergraduate academic studies

Course Status (compulsory/elective): compulsory

Semester (winter/summer): winter

Language of instruction: Serbian

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 6

Prerequisites: None

Course Aims:

The main goal of course is to acquire knowledge of the basic principles and methods of conventional and unconventional fruit breeding. The course provides the necessary theoretical knowledge for the development of breeding thought on a multidisciplinary basis. The ultimate goal is to master the knowledge and skills needed to create new varieties and rootstocks that lead to increasing fruit production, improving fruit quality and reducing production costs.

Learning Outcomes:

By passing the exam in this course, the student should be able to set clear selection goals in the context of new ideas, knowledge and techniques, select initial material for selection and define adequate ways to improve varieties and rootstocks through hybridization, mutational breeding and basic unconventional methods.

Syllabus:

Theory

Introduction-breeding as an art and science of fruit growing; Plant breeding as evolution in human hands - historical development of fruit breeding from domestication of wild forms, contribution of individual discoveries of importance for the development of genetics and plant breeding to the theoretical foundations of biotechnology.; Primary and secondary centers of divergence of cultivated plants; Selection from natural populations; Sources of genetic variability - (1) Gene recombination, hybridization, methods of selection for economically most important traits and genetic gain from selection, selection of parental pairs; (2) Mutations in fruit breeding and clonal selection; (3) Unconventional methods of fruit breeding and genetic engineering; Analysis of parameters of adaptability, stability and productivity of rootstock and variety; Molecular methods in fruit breeding; Release and protection of newly created varieties and rootstocks of fruit trees.

Practice

International descriptors and databases; Basic taxonomic categories; Methods of conservation of genetic resources and the International Convention on Plant Genetic Resources for Food and Agriculture; Convergent and divergent crossing methods; Crossbreeding techniques and methods; Techniques for germination of hybrid seeds and growing seedlings to fruiting; Embryo culture; Preselection methods; Application of molecular markers in breeding; Other forms of teaching: Practical work on stratification and sowing of hybrid seeds, planting and nurturing of hybrid seedlings; Practical work on the identification of alleles for sRNase using PCR method and

electrophoresis. Study research work: Preparation and presentation of a seminar work

Required Reading: Mišić M. Opšte oplemenjivanje voćaka. NOLIT, 1987

Weekly Contact Hours:	**Lectures:4**	**Practical work:2**

Teaching Methods:

Lectures and Practical classes. The lectures present a theoretical part accompanied by characteristic examples for easier understanding of the material. In addition to lectures, consultations are held regularly. Presentations from lectures are available in electronic form. Parts of the material, divided into logical units, can also be taken during the teaching process through a colloquium. Colloquia are taken in writing in the form of a test.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation		written exam	
Practical work		oral exam	60
Preliminary exam(s)	20	Lecture attendance	10
Seminar(s)		Practical classes attendance	10

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