

Study program: Organic crop and livestock production
Type and level of study: Bachelor academic studies
Course Title: AGROBIOTECHNOLOGY
Professors: Dr. Panković M. Dejana, Full professor; Dr. Ljubinko B. Jovanović, Full professor
Status: Compulsory, semester IV
ECTS: 8
Prerequisite: None
<p>The goal of the course</p> <p>The main objective of the course in agrobiotechnology is to provide students with the knowledge about and use of modern biotechnological methods in agriculture. In addition to mastering basic knowledge of molecular biology, the students should acquire the relationship between plants and animals and their environment, and biotic and abiotic stresses which are the most common cause of reduced production. Students learn about the biotechnological methods used to increase resistance to diseases by using non-GMO biotechnology methods.</p>
<p>The outcome of the course</p> <p>Training students for practical application of modern biotechnological methods in agriculture and adoption multidisciplinary approach to solving basic problems in agriculture</p>
<p>Syllabus</p> <p><i>Theoretical</i></p> <ol style="list-style-type: none"> 1. Introduction to Biotechnology (Definition and classification of biotechnology; Plant biotechnology; Basic concepts of genome); 2. Gene analysis (analysis and amplification of nucleic acids; enzymes as tools; General concepts of PCR as a diagnostic method); 3. Laboratory methods in the analysis of the genome of plants 1. (DNA extraction using the DNeasy Plant Mini Kit (Qiagen). Determination of extracted DNA by spectrophotometry - Nano view spectrophotometer); 4. The growing of genetically resistant plants that are resistant to diseases (diseases of plants; measures to control plant diseases, application of biotechnology to increase the resistance of plants to disease); 5. Increasing the case-study of sunflower resistance to downy mildew (sunflower and sunflower diseases, downy mildew, genes for resistance to downy mildew, use of molecular markers in sunflower breeding for resistance to downy mildew Genetic map Pl6 loci) 6. Laboratory methods in the analysis of the genome of the plants 2. (PCR identification of the genes for resistance to diseases); 7. Laboratory methods in the analysis of the genome of plants 3. (Digestion of the PCR products by restriction enzymes and electrophoresis); 8. Useful microorganisms in agriculture (Application of Trichoderma-e to increase the resistance of plants to biotic and abiotic stresses) 9. Laboratory methods in the analysis of the genome of microorganisms from soil 1. (DNA extraction from the soil and from pure cultures; Determination of extracted DNA by spectrophotometry - Nano view spectrophotometer); 10. Laboratory methods in the analysis of the genome of microorganisms from soil 2. (PCR identification of strains of Trichoderma variability of ITS sequences); 11. Biotechnology and environmental protection (environmental and health issues related to environmental protection, ethical and legal aspects of biotechnology); <p><i>Practical lessons</i> - Preparation for laboratory work, introduction to laboratory equipment, making solutions, determination of pH, colorimetry and spectrophotometry (carbohydrates and proteins).</p>

Literature

Watke P.S. Agro-Biotechnology for Sustainable Development. 2012. Pragun Publication
 Reviewed by Nigel Chaffey (2009): The plant cytoskeleton: a key tool for agro-biotechnology

The plant cytoskeleton: a key tool for agro-biotechnology.

Berlin, Heidelberg, New York: Springer.

Arie Altman and Paul Michael Hasegawa (2012): Plant Biotechnology and Agriculture: Prospects for the 21st Century. Academic press

Number of lectures: 6				Other Lessons
Lectures: 3	Practices: 3	Other forms of teaching:	Student research work:	

Teaching methods:

Score (maximum 100 points) Whole process is aimed to organize interactive and multimedia presentation. Presentations of students' seminar papers, and students' work involved in elaboration of various topics are an integral part of the teaching process. Lectures of experts from the country and abroad which contribute to better understanding and perception of the complexity of the subject. The practical part of the training takes place through laboratory exercises in groups, watching and discussion of film material and consultations.

Pre-commitments	Points	The final exam	Points
Activity during lectures	10	Written exam	40
Practical lessons	10	Oral examination	
Preliminary exam	20		
Seminars	20		
<i>Total</i>	60		40