

**Building Capacity
of Serbian Agricultural
Education
to Link with Society**



Tempus

**Izgradnja kapaciteta
srpskog obrazovanja
u oblasti poljoprivrede
radi povezivanja sa društvom**

**Coordinator:
University of Belgrade
Faculty of Agriculture**

**Koordinator:
Univerzitet u Beogradu
Poljoprivredni fakultet**

COURSE REGISTRATION FORM

Teacher	Jelena Jovičić Petrović
University	University of Belgrade, Faculty of Agriculture
Course	Microorganisms in sustainable agriculture
Target	Agricultural Middle Schools
Type	classic
Duration	1 day - 8 hours

Description	<p>For decades, the development of intensive agriculture has led to a significant use of pesticides and fertilizers, thus leading to the growing problems related to the protection of natural resources and the impact on human health. Such a trend in agriculture caused the considerably larger focus on conventional production in the education of future staff in the field of agriculture.</p> <p>However, the soil is the basis of the safe food production. The living soil component - microorganisms is the part which is usually ignored, although the microbial populations in soil are the basis of the fundamental processes that lead to the stability and productivity of agroecosystems.</p> <p>Regarding the foregoing, the course goal is that teachers understand the importance of the role of microbiological processes in the agricultural soil as a sustainable ecosystem, and to get closer to the possibilities of advanced microbiological inoculums to achieve better quality of soil and crops.</p> <p>The aim is to motivate teachers to continuously and independently acquire new knowledge in this field, as well as to influence on the development of students' awareness of the importance of the conservation of natural resources which is always relied on biological processes. Due to the acquired knowledge and adopted principles, teachers will be strengthened and motivated for the application of innovative knowledge in the theoretical as well as in practical classes – in the management of experimental fields owned by majority of agricultural schools.</p>
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Contents	<ol style="list-style-type: none"> 1. Microbiological processes in agricultural soil; 2. Plant Growth Promoting Microorganisms; 3. Microorganisms and soil health; 4. Microbial inoculants in sustainable agriculture; 5. The effect of agricultural practices on microbiological processes in soil.
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Objectives	<ol style="list-style-type: none"> 1. Increasing the professional competence of teachers according to the progress in modern biotechnology in the area of sustainable agriculture; 2. Enabling participants to understand the significance of soil as an ecosystem; 3. Getting insight in advantages and upgrade of the knowledge about the possibilities of microbial inoculants application;
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4. Acquiring knowledge and developing awareness about the importance of agricultural effects on microbial activity and sustainability in agriculture;
5. Improvement of the teamwork skills.

Activities

1. A brief interaction in which participants have to connect certain microorganisms with respective soil processes, first individually and then with teacher's help. The purpose of the interaction is getting insight in to the previous knowledge of the participants. 20 min
2. Participants listen to an introductory lecture about microbial diversity in soil, microbiological processes and their importance to sustainable agriculture, with emphasis on the trend in agriculture and education regarding the intensive/sustainable agriculture. 40 min
3. Participants individually combine the names and definitions of microbial processes in the cycling of carbon and nitrogen, followed by a brief discussion with the teacher. 20 min
4. The teacher briefly presents the main groups of microorganisms that are important to sustainable agriculture and which will be the topic of the task that follows (microorganisms in humification, azotofixation, plant growth promoting microorganisms, bioremediation agents, and mycorrhizal fungi). 15 min
5. Participants are divided into five groups. The teacher gives them prepared material for group work. 5 min
6. Groups have to prepare presentation for others about one of the previously listed groups of microorganism (with the emphasis on their primary role, application possibilities and advantages of their use in sustainable agriculture). Participants have two classes for this task, also provided some literature, possibility to search the internet and teacher's help if needed. 90 min
7. One representative of each group presents the results of his group (method of choice - poster, presentation, other, etc..). Other participants listen actively with taking notes, which will be useful in the next task (teacher emphasis that before presentations). Teacher comments presentations with additional explanation where necessary, other participants ask questions. 120 min
8. Participants listen actively with taking notes (purpose of the notes, same as in the previous task) about the application of microbial inoculants in agriculture (biocontrol agents, bio-fertilizers, mycorrhizal fungi) and positive and negative effect of agricultural practices on microbiological processes in soil. 70 min
9. At the end of the course, participants in groups with the help of their notes have to make a summary that includes the groups of microorganisms with the list of advantages and disadvantages of the application of certain microorganisms as inoculants, as well as the influence of agricultural practices on the effect of inoculants application. 60 min

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Materials

Papers with the names of microorganisms and processes for the first brief interaction, computers with internet access, paper, markers, video beam, printed text related to significant groups of microorganisms in soil, scheme showing microbial processes in the nitrogen and carbon cycle.
