Study program: BIOLOGY

Type and level of studies: Master academic studies of second degree

Course unit: B-204 Applied mycology

Teacher in charge : Branislav R. Ranković, Marijana M. Kosanić

Language of instruction: English

ECTS: 6

Prerequisites: /

Semester*:* Winter Semester

Course unit objective: To give students theoretical and practical knowledge of the fungal kingdom. To introduce students with the production of fungal secondary metabolites and their properties. To study the technology of cultivation the most popular edible and medicinal mushroom species. To study the processes of fermentation, biodegradation and ecological aspects of the fungus.

Learning outcomes of Course unit: Gaining knowledge of the general characteristics of fungi and the importance of these organisms in nature and the practical activities of man. Introducing the technology of cultivation of mushrooms and their protection; the fermentation using fungi and their role in the baking industry, in the production of alcoholic drinks and fermented milk products; with the production of fungal secondary metabolites and their importance in biotechnology.

Course unit contents

Theoretical classes

Introduction to mycology. History of mycology. Nutrition, metabolism and reproduction of the fungus. Laboratory culture of the fungus. The study of the living culture. Types of deterioration and its prevention. Protection of food from contamination of mushrooms. Industrial use of mushrooms. Production micelyal biomass. Alcoholic fermentation (production of ethyl alcohol, industrial production of beer, other alcoholic fermentation). Fermentation of food products. Secondary metabolites of fungi. The metabolites of fungi with stimulating effects on higher plants. Antibiotics. Mycotoxins. Curbing the growth of toxic mold in food and animal feed. Organic acid production. Growing mushrooms. Cultivation of mushrooms. Types of mushroom farms. Production of mycelium. Production of substrate - compost preparation covering. Incubation phase. Phase of fruiting body. Reading. Protection against diseases and pests. Growing oyster mushrooms. Growing conditions. Production of mycelium. Facilities for oyster production. Raw materials in which to grow oyster mushrooms. Inoculation of substrate. Incubation. Period of formation of fruiting body. Picking fruiting bodies. Diseases and pests of oyster and protection. Growing shiitake mushrooms. Growing mushrooms on logs of wood. Growing mushrooms on a substrate from a mixture of different materials. Preparation of the substrate. Inoculation of substrate mycelium of fungi. Incubation. Formation fruiting bodies. Picking fruiting bodies. Diseases and pests shiitake mushrooms and their control

Practical classes

Practical classes follow the teoretical classes with the same program. Include experimental work, field work, visits to mushroom farms and industrial facilities for the fermentation and production of bread, alcoholic drinks, production of antibiotics, etc.

Literature

Alexopoulos, C. J., Mims C. W., Blackwell M.. 1996. Introductory Mycology. 4th ed., John Wiley & Sons, New York. P. 880, ISBN: 978-0-471-52229-4.

Stamets P. 2000. Growing Gourmet and Medicinal Mushrooms. Amazon Best Sellers Rank, p. 514. ISBN-10: 1580081754.

Ramesh Maheshwari. 2005. Fungi, Experimental Methods in Biology. CRC Press, Taylor and Francis, Boca. Raton, FL, USA.

Number of active teaching hours				**Other classes**
Lectures:	Practice:	Other forms of classes: Mentoring (consultative) system	Independent work:	

Teaching methods

Theoretical classes (power-point presentations)

Practical classes (laboratory exercises and field work)

Examination methods (maximum 100 points)

Exam prerequisites	**No. of points:**	**Final exam**	**No. of points:**
Student's activity during lectures		oral examination	40
practical classes/tests		written examination	30
Seminars/homework	30		
Other			

Grading system

Grade	No. of points	Description
10	91 - 100	Excellent
9	81 - 90	Exceptionally good
8	71 - 80	Very good
7	61 - 70	Good
6	51 - 60	Passing
5	< 50	Failing