

Study Programme: BSc in Biology			
Degree level: Bachelor degree			
Course Title: MYCOLOGY			
Professor: Dr. Maja Karaman, Dr. Milan Matavulj			
Elective Course			
Number of ECTS: 5			
Prerequisites: Credit points of Chemistry, Cell Biology and credit points of Microbiology and Biology of Algae and Fungi.			
Course Objective: A course designed to acquaint students with biology, role and significance of fungi, numerous group of organisms (estimated more than 1,000.000 species) lately recognized as separated and specific kingdom of organisms.			
Course Outcome: Enabling students for independent and individual research work: experiment design, results obtaining and recording, analysis and interpretation of results, and elaboration and presentation, eventually use of new experience in conducting simple experiments related to the specific relationship of fungi with other organisms; to explain the role of fungi in different biotechnological processes and in natural environments.			
Course Content:			
<p><i>Theoretical part:</i> Students get acquainted with general characteristics of fungi, with the biodiversity of fungi and fungi-like organisms as well as with the contemporary concept of contemporary fungal taxonomy and systematics. Understanding fungal cell functional ultrastructure, hyphal growth of mycelial fungi and growth of cellular yeasts; Kinetics of fungal growth. Differentiation and development of fungi. Fungal nutrition strategies: saprotrophism, parasitism, mutualism (mycorrhiza). Fungal secondary metabolism and effect of ecological factors on fungal metabolism. Fungal reproduction: spores and their dissemination. Genetics of fungi; Control of fungal growth and use in biotechnology. Fungal bioactive agents in medicine. Mycetisms and mycotoxins. Emphasis will be placed on research of fungal enzymes and other bioactive compounds, what should enable students to understand contemporary tendencies of use fungi in different biotechnology fields, as well as to understand the fungal role and problems related to the biologically active substances in the environment.</p> <p><i>Practical part:</i> In this course students get acquainted with the contemporary concept of microbiological laboratory practice, considering predominantly fungi. A practical work is designed to acquaint students with working rules in laboratory; with the mode of use of laboratory equipment. Also students get acquainted with the growth fungi in laboratory, on/in different media. Skills in preparation of native preparatives of yeasts, molds, and macrofungi and observing their morphology, functional composition as the basis for elementary taxonomic classification of these organisms according to dichotomous keys. Also the course covers fundamentals of skills in preparing preparatives for examining morphology of mycelial fungi, and learning methods of micrometry. Developing competence in cultivation of fungi: gaining skills in preparation of different types of media for cultivation and mode of nutrients use for fungal growth. Principles of experimental work: the best sampling practice (water, soil, air), sample maintenance, and cultivation procedure. Developing skills in results recording procedure. Getting knowledge in morphology of colonies of fungi. Methods of purification of fungal culture. Cultivation on agar plates and in tubes on agar slope and in agar broth, for description of cultural characteristics of isolates. Conservation for culture collection and learning rules and procedures for culture maintenance. Through the practicals, students get acquainted with quantification (spectrophotometrically) of physiological properties of cellulolytic activity of isolated fungi. Cultivation with the aim of optimization of fungal growth in different conditions of experimental temperature, moisture (water regime), salinity, light intensity, and oxygen presence (aerobe/anaerobe conditions), pH, etc. Growth on xenobiotics as the substrate. Visit to the local brewery and to the local natural fungal biotops.</p>			
Reading List: 1. Radnović D, Matavulj M, Karaman M. (2007). Mycology. Faculty of Sciences, University of Novi Sad: Daniel Print. ISBN: 978-86-7031-118-3. (In Serbian).			
2. M. Muntanjola – Cvetković: General Microbiology. NIRO Književne novine, Belgrad (In Serbian).			
3. Carlile M, Watkinson S, Gooday G (2006): The Fungi, 2nd Edition. Elsevier Academic press (ISBN: 0127384464)			
4. Deacon, J. (2005): Fungal biology. 4th Edition, Blackwell Publishing Ltd. ISBN-1-4051-3066-0.			
5. Kendrick, B. (2001): Fifth kingdom. 3 rd Edition. Mycologue Publications, Sidney, Canada. ISBN-1-58510-022-6			
6. Radnović D, (2011): Lecture outlines and Power-point presentations. (In Serbian)			
Total hours:			
Lectures: 2	Practicals:	Other: 2	Student research work:
Methods of instruction: Lectures, practicals, consultations, seminars, colloquia, visiting to fungal biotops and biotechnological plants			
Assessment (maximum number of points 100)			
Requirements	points	Final exam	points
Active participation in lectures	5	Practical exam	15
Student seminars	40	Oral exam	40
Remark: Students will develop a deeper understanding of experimental work in microbiological laboratory through independent study. Part of the learning material will be available on the internet.			