

Study Programme : BSc in Biology				
Degree level: Bachelor degree				
Course Title: MEDICINAL AGENTS FROM ALGAE AND FUNGI				
Professor: Dr. Maja Karaman, Dr. Milan Matavulj				
Elective Course				
Number of ECTS: 5				
Prerequisites: Credit points of Chemistry, Cell Biology, Microbiology and Systematics of Algae and Fungi.				
Course Objective: A course designed to acquaint students with the principles of isolation, cultivation and identification of algal and fungal cultures. Emphasis will be placed on understanding of microbial primary and secondary metabolism, as well as in developing skills for conducting simple biotechnological processes of production of biologically active compounds.				
Course Outcome: Enabling students for independent and individual experimental work in the field of algal and fungal primary and secondary metabolism: experiment design, results obtaining and recording, analysis and interpretation of results, and elaboration and presentation.				
Course Content: <i>Theoretical part:</i> Students get acquainted with biology of algae and fungi as the basis for bioactive compounds production; Algal bioactive metabolites, their nomenclature and classification. Fungi and lichens and their bioactive metabolites; Bioactive agents in medicine and pharmacy (antibiotics, antitumor agents, antiviral agents, nematocides); algal and fungal metabolites in treating cholesterolemia, as coagulants and anticoagulants, angiotensins, cardiacs, and aphrodisiacs, as sexual attractants and in cosmetics, as tonics, as immunomodulators, as biopesticides, biofertilizers, biosynthetic plastics etc. Algal and fungal biotransformations (production of hormones, organic acids, alcohols). Algae and fungi as sources of healthy and organic food (vitamins, minerals, essential aminoacids). Algal and fungal toxins, alkaloids, mycotoxins. Emphasis will be placed on research of algal and fungal bioactive compounds, what should enable students to understand contemporary tendencies of their use in various biotechnology fields, as well as to understand their role and problems related to biologically active substances in the environment. <i>Practical part:</i> Developing competence in experimental work: inoculation on media and cultivation procedure. Developing skills in results recording. Methods of algal and fungal culture cultivation, conservation and procedures of culture maintenance. Through the practicals, students get acquainted with the culture and physiological properties of isolated cultures. Cultivation with the aim of optimization of algal and fungal growth in different conditions of experimental conditions, shifting from primary to secondary metabolism. Research in production of antibiotics and antibiogram experiments.				
Reading List: 1. Antoni H Rouz: (1975): Chemical microbiology. ICS Belgrad. (In Serbian and in English). 2. Pejin D: Industrial microbiology (2003): University of Novi Sad, Faculty of Technology. (In Serbian). 3. Matavulj M, Gajin S, Petrović O, Radnović D, Svirčev Z, Simeunović J, et al.(1988): Biologically active compounds of higher plants, fungi, algae, and bacteria. Institute of Biology, Faculty of Sciences, University of Novi Sad. (In Serbian). 4. Duraković S. and Duraković L (2003): Mycology in Biotechnology. Univversity of Zagreb, (In Croatian). 5. M. Muntañola – Cvetković: General Mycology. NIRO Književne novine, Belgrad. (In Serbian). 6. Svirčev Z (2005): Microalgae and Cyanobacteria in Biotechnology. Faculty of Sciences, University of N. Sad, (In Serbian). 7. Radnović D, Matavulj M, Karaman M (2007): Mycology. Faculty of Sciences, University of Novi Sad, WUS Austria ISBN 9787-86-7031-118-3. (In Serbian). 8. Vučetić J (1985): Microbial synthesis of antibiotics. KIZ“Centar“, Belgrad. (In Serbian). 9. Vučetić J, Vrvic M (1992): Mycrobial synthesis of vitamins. Nova prosveta, Belgrad. (In Serbian). 10. Vučetić J (1982): Mycrobial synthesis of aminoacids. Privredni pregled, Belgrad. (In Serbian). 11. Matavulj M (2010): Lecture outlines and power-point presentations (In Serbian) 12. Madigan MT, Martinko JM (2006): Brock Biology of Microorganisms. Prentice Hall, Pearson Education Internat. (In Engl.)				
Total hours:				
Lectures: 2	Practicals: 2	Other:	Student research work:	
Methods of instruction: lectures, practicals, consultations, seminars, colloquia				
Assessment (maximum number of points 100)				
Requirements	points	Final exam		points
Active participation in lectures	5	Practical exam		15
Colloquia (Pre-exam testing)	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.				