Course Unit Descriptor

Study Programme: MSc in Biology
Course Unit Title: Harmful Algae
Course Unit Code: DEO32
Name of Lecturer(s): Dr Zorica Svirčev
Type and Level of Studies: Integrated studies
Course Status (compulsory/elective): Elective
Semester (winter/summer): Winter
Language of instruction: English or Serbian
Mode of course unit delivery (face-to-face/distance learning): face-to-face
Number of ECTS Allocated: 6
Prerequisites: none
Course Aims: Emphasis will be placed on understanding the role and importance of macroalgae, cyanobacteria and microalgae as the cause of environmental disasters, diseases and poisoning in humans and animals. The appearance and activity of undesirable algae in natural ecosystems, particularly in relation to humans will be studied in order to prepare students for the application of knowledge gained through solving various problems related to environmental protection and reduction the risk of illness and deaths in humans.
Learning Outcomes: After passing the course of Harmful Algae students are expected to: be able to explain the causes of occurrence of harmful algae in aquatic ecosystems, as well as in the form of pathogen; show an understanding of environmental and medical consequences of the appearance and activity of harmful algae; explain the ecological, physiological and genetic basis of toxicity, pathogenicity and invasion of algae; describe and identify the specific effects of toxic, infective and invasive algae and solve the problems caused by the appearance of toxic, invasive, pathogenic and other harmful algae in aquatic ecosystems and the environment (algae cause the unpleasant smells in recreational water systems and drinking water).
Syllabus: *Theoretical part* The causes of harmfula algae apperiance and their overgrowth: eutrofication, 'water blooms, invasion, pathogenicity of algae. Problems caused by harmful algae: health aspects, environmental problems, cyanobacteria and cyanotoxins: the group of cyanotoxins, toxin appearance in water ecosystems. The infuence of cyanotoxins on aquatic organisms,humane and animal health. Monitoring and prevention measures. Phycotoxins: poisoning of aquatic and terrestrial animals and humans, allergies and changing of organoleptic properties of water. Prototheca - pathogenic microalga: taxonomy, morphology, ecology, biochemistry and genetics of microalgae, epidemiology and significance protothecal infections in human medicine and veterine, diagnosis and therapy pf protothecosis. Caulerpa - invasive macroalga: taxonomy, morphology, ecology, genetics, invasion, toxicity and influences on other species. Monitoring and prevention, sanation methods.
Required Reading: 1. Svirčev Z. (2005): Microalgae and Cyanobacteria in Biotechnology. Faculty of Sciences, University of N. Sad (in Serbian). 2. Chorus I., Bartram J. (1999): Toxic Cyanobacteria in Water. WHO – E&FN Spon, London, New York (in English).

3. Graneli E., Turner J. (2006): Ecology of Harmful Algae. Springer – Berlin, Heidelberg, New York (in English).
4. Suvajdžić, Lj. (2004): Handbook of microbiology with exercises for students of pharmacy. Ortomediks, Novi Sad.

Weekly Contact Hours: 2	**Lectures:** 2	**Practical work:**

Teaching Methods:

Lectures, practical laboratory work in student groups

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation	10	written exam (practical)	
Practical work		oral exam	40
Preliminary exam(s)	40	…….	
Seminar(s)	10		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.