

Study program : Biology and Ecology					
Type and level of studies: Master studies of Biology and Ecology					
Course unit: Applied algology					
Teacher in charge : Snežana B. Simić					
Language of instruction (<i>English or other foreign language</i>): English					
ECTS: 6					
Prerequisites: enrolled 1st year of study					
Semester (<i>Winter Semester or Summer Semester</i>): Winter semester					
Course unit objective					
The aim of the course is to point out the multiple significance of algae and possibilities of exploiting them by people in different areas of life (environmental, industry, food and aquaculture).					
Learning outcomes of Course unit					
The outcome of the course is to gain basic knowledge about the application of algae in various fields, as well as mastery of basic skills, methods and techniques of applied algology					
Course unit contents					
<i>Theoretical classes</i>					
Applied algology (Phycology): definition and significance. History of development of algae biotechnology. Collections of algal cultures. The mass cultivation of algae. The importance of algae in the diet of humans and animals. Algae in the manufacture of biologically active compounds. Pharmaceutical and medical significance of algae. The use of algae in cosmetics. Wastewater treatment with microalgae and cyanobacteria. Cultivation of damaged soil. Production of various commercial compounds from algae biomass. Bioremediation of contaminated soils (phycoremediation and cyanoremediation). Algae as bioindicator of water quality. Invasive species. The role of algae in aquariums.. The importance of algae in agroecosystems. Microalgae and cyanobacteria - alternative energy sources. Reducing the concentration of CO ₂ in the atmosphere and harmful effects of "ozone" hole. Ecological models of systems - biotechnological applications of microalgae and cyanobacteria. The current state and future of the algae biotechnology.					
<i>Practical classes</i>					
Algae determination. Microscopy, optical microscopes, preparations for microscopy and making durable preparations. Measuring. Photomicrography. Growing algae (lab, dishes, chamber, scales). Methods sterilization. Nutrients substrate for algae growing. Methods for algae isolation. Collections culture. Internet websites. Data bases. Collection culture. Use algae for nutrition people and animal (preparations from market). Use of algae in medical and cosmetic purposes (preparations from market). Legal regulations in this areas. Visit to the water treatment plant Cvetojevac. Algae as water bioindicators. Sampling methods: plankton, benthos, periphyton; fixation and canning algae. Assessment of water status based on algae. Innovative algae, toxins. Algae in aquariums - influence of physical and chemical factor to development algae. Methods prevention uncontrolled development of algae in aquariums (copper - sulfate). Saprobic list, saprobiological index. saprobiological methods. Biotic index. Part of the thematic units will be processed through seminar works.					
Literature					
Svirčev, Z. (2005): Mikroalge i cijanobakterije u biotehnologiji. PMF. Novi Sad.					
Simić, S., Simić, V. (2012): Ekologija kopnenih voda (Hidrobiologija 1). Biološki fakultet u Beogradu. PMF u Kragujevcu, 304.					
Denić Lj., Čađo S., Đurković A., Novaković B., Dopuđa-Glišić T., Veljković N., Stojanović Z., Milovanović J., Domanović M. (2015): Status površinskih voda Srbije. Analize i elementi za projektovanje monitoringa. Ministarstvo poljoprivrede i zaštite životne sredine Agencija za zaštitu životne sredine. http://www.sepa.gov.rs/download/VodeSrbije/StatusPovrsinskihVodaSrbije.pdf					
E.W. Becker (1994): Microalgae biotechnology and microbiology, Cambridge University Press, Cambridge. pp 293.					
Number of active teaching hours				Other classes	
Lectures:	Practice:	Other forms of classes:	Independent work:		
3	2	0	0		
Teaching methods					
Lectures, power-point presentations, Internet use, seminars, field and laboratory practice					
Examination methods (maximum 100 points)					
Exam prerequisites		No. of points:		Final exam	No. of points:
Student's activity during lectures		5		oral examination	50

practical classes/tests	5	written examination	20
Seminars/homework	30		
Project	-		
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	0-51	Failing

(Table 5.2) Course unit description