Course ID: HTHI10	**Course name: BIOPROCESS WASTEWATER TREATMENT**		
Cycle: SECOND	**Year: FIRST**	**Semester: I**	**ECTS credits: 4**
Course status: ELECTIVE		**Total course hours: 45** Lectures: 30 Laboratory: 15	
Teaching participants:	**Teachers and associates with expertise in the field of biotechnology**		
Prerequisite for enrollment:	-		
Course aims:	Introducing students to biotechnological methods and techniques of wastewater treatment.		
Thematic course units:	Environmental protection and the role of biotechnology Sources of wastewater generation and treatment: pretreatment and primary processing Wastewater characterization Objectives of wastewater treatment General scheme of bioprocess engineering Biological process units Industrial biotechnology Use of microorganisms for the purpose of wastewater treatment Biological wastewater treatment: removal of organic and inorganic constituents (carbon, nitrogen and phosphate) Anaerobic removal of organic pollutants Biofilm wastewater treatment systems Sludge disposal		
Learning outcomes:	Knowledge: General characteristics of water and classification of impurities in water; Classification of wastewater (natural water, drinking water, industrial water, municipal wastewater, ...); International standards for water quality Skills: Application of several biotechnological methods to wastewater treatment; Students will develop skills to distinguish types of wastewater and various other methods of treatment; Student will be able to apply knowledge and create a conceptual design for the treatment of certain types of wastewater-plant devices Competences: Students will be able to understand and explain the similarities and differences between conventional and biotechnological wastewater treatment methods		
Teaching methodology:	Auditory lectures; Laboratory exercises		

Assessment methods and grading system[1]:

Grading criteria			
	Criteria	Maximal score	Required score
1.	Class attendance	5	3
2.	Class activities	10	5
3.	Midterms	45	25
4.	Final exam	40	22
	Total	100	55

Scores and grading		
Score	Grade (B&H)	Grade (ECTS)
< 55	5	F, FX
55–64	6	E
65–74	7	D
75–84	8	C
85–94	9	B
95–100	10	A

Literature[2]:

Supplementary literature:

1. Josip Baras, Vlada Veljković, Stevan Popov, Dragan Povrenović, Miodrag Lazić, Branislav Zlatković, (2009). Osnovi Bioprocesnog inžinjerstva, Univerzitet u Nišu, Tehnološki fakultet Leskovac
2. Lawrence K. Wang, Volodymyr Ivanov, Joo-Hwa Ta, Yung-Tse Hung (2010). Environmental Biotechnology, Handbook of Environmental Engineering, Volume 10, Springer, UK
3. Nicholas P. Cheremisinoff (1996). Biotechnology for Waste and Wastewater Treatment, NP, USA
4. N. F. Gray (2004). Biology of Wastewater Treatment, 2nd Edition, University of Dublin, Ireland

[1] The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

[2] The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton