No. 37

Attachment No.3		**Course syllabus for First cycle studies**				
1.	**Course title**	**Green metallurgy**				
2.	**Code**	MDE8E5				
3.	**Study Program**	Metallurgical digital engineering				
4.	**Study program organizer (unit,institute, department, division)**	Faculty of Technology and Metallurgy, University “Ss. Cyril and Methodius” in Skopje				
5.	**Degree (first, second, third cycle)**	First cycle				
6.	**Academic year / semester**	Forth year, VIII sem.	7.	**Number of ECTS**	5	
8.	**Instructors**	Prof. Perica Paunović				
9.	**Prerequisites for courseenrollment**	Ferrous metallurgy				
10.	**Objectives of the course syllabus (competencies):** Acquiring knowledge about the basic principles of green engineering and their implementation in metallurgy.					
11.	**Content of the course:** 1. Principles of green engineering, sustainable development, and circular economy. 2. Application of green engineering principles in metallurgy. Green metallurgy. 3. Recycling of metals. Energy saving. Conservation of mineral resources. 4. Replacement of fossil fuels. Solar energy. Biomass. Hydrogen. 5. Utilization of slag and dust. Extraction of metals. Application in construction. Obtaining glass-ceramics. Reinforcement of polymer composites – geomembranes.					
12.	**Study methods:** Lectures and exercises, consultations, project (homework, seminar) assignments, home study (exam preparation)					
13.	**Total available time**	150				
14.	**Allocation of available time**					
15.	**Teaching activities**	15.1.	Lectures	30		
		15.2.	Exercises (laboratory, computational), teamwork	30		
		15.3	Industrial practice	0		
16.	**Other types of activities**	16.1.	Project assignments	15		
		16.2.	Independent assignments	15		
		16.3.	Home study	60		
17.	**Grading system**					
	17.1.	Tests: pts		80		
	17.2.	Seminar work/project, written and oral presentation: pts		10		
	17.3.	Final exam: pts		10		
18.	**Grading criteria (points/grade)**	Up to 61 points		5 (five) (F)		
		From 61 to 69 points		6 (six) (E)		
		From 70 to 79 points		7 (seven) (D)		
		from 80 to 89 points		8 (eight) (S)		
		From 90 to 95 points		9 (nine) (B)		
		from 95 to 100 points		10 (ten) (A)		
19.	**Prerequisites for taking the final exam**	Minimum 11 pts from activities 17.1 and 17.2				

20.	**Language in which lectures are conducted**		English			
21.	**Method for monitoring the quality of lectures**		Anonymous student survey			
22.	**LITERATURE**					
	22.1.	Compulsory literature				
		No.	Author	Title	Publisher	Year
		1.	Perica Paunović,	Green metallurgy, an internal script	Faculty of Technology and Metallurgy, Skopje	2024
		2.				
		3.				
	22.2.	Additional literature				
		No.	Author	Title	Publisher	Year
		1.				
		2.				
		3.				