No. 21

Attachment No.3		**Course syllabus for First cycle studies**			
1.	**Course title**	**Electrometallurgy**			
2.	**Code**	MDE6			
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/ VI sem.	7.	**Number of ECTS**	5
8.	**Instructors**	Aleksandar Petrovski, Associate professor			
9.	**Prerequisites for courseenrollment**	Physics 2			
10.	**Objectives of the course syllabus (competencies):** Gaining theoretical and practical knowledge of the technological processes of obtaining and refining metals from solutions and melts using electric current.				
11.	**Content of the course:** Content of the subject program: 1. Theoretical foundations. Faraday's laws, Electrolysis and polarization, Equilibrium potential, Mechanism of electrolytic reaction, Electrochemical kinetics, Diffusion kinetics, Crystallization kinetics, Anodic processes, Cathodic processes, Utilization of current in electrolysis. 2. Technologies. Electrolysis in aqueous solutions, Electrorefining of copper, electrorefining of silver and gold, Electrowinning of zinc, Electrowinning of cadmium and nickel, electrolysis in molten salts, Electrowinning of aluminum, electrowinning of magnesium and sodium.				
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.	Konstantin I. Popov, Stojan S. Djokić, Branimir N. Grgur	Fundamental Aspects of Electrometallurgy	Springer New York, NY	2002
		2.				
		3.				
	22.2.	Additional literature				
		No.	Author	Title	Publisher	Year
		1.				
		2.				
		3.				