No. 4

Course syllabus for First cycle studies					
1.	**Course title**	**Ferrous metallurgy**			
2.	**Code**	MDE5M4			
3.	**Study Program**	Metallurgical Digital Engineering			
4.	**Study program organizer (unit, institute, department, division)**	Faculty of Technology and Metallurgy			
5.	**Degree (first, second, third cycle)**	first			
6.	**Academic year / semester**	Third	7.	**Number of ECTS 7**	Fifth
8.	**Instructors**	Dr. Goran Nachevski, full professor			
9.	**Prerequisites for course enrollment**				
10.	**Objectives of the course syllabus (competences):** Acquiring knowledge of technological processes for the production of pig iron and steel. **Acquired skills (competences):**				
11.	**Content of the course:** General concepts and principles for the production of pig iron and steel. Thermodynamics and kinetics of the processes for producing pig iron. Basic components and systems. Metallurgical slags. Reactions between metal and slag. Oxidation, reduction, desulfurization, and dephosphorization. Raw materials for pig iron production. Fuels. Furnaces. Refractory materials Production of pig iron (blast furnace and electric furnace). New technologies for pig iron production. Thermodynamics and kinetics of the processes for producing steel. Basic components and systems. Reactions between metal and slag. Reduction, desulfurization, and dephosphorization. Raw materials for steel production. Furnaces. Refractory materials. Production of steel (classical, modern, electric processes).Deoxidation and alloying of steels.				
12.	**Study methods:**				
13.	**Total available time**		210		
14.	**Allocation of available time**				
15.	**Teaching activities**	15.1.	Lectures - theoretical teaching. classes	45	
		15.2.	Exercises (laboratory, lecture), seminars, teamwork: classes	45	
		15.3.	Practice: classes	0	
16.	**Other types of activities**	16.1.	Project tasks: classes	20	
		16.2.	Independent tasks: lessons	20	
		16.3.	Homework - assignments	80	
17.	**Grading system**				
	17.1.	Tests: points		80	
	17.2.	Seminar paper/project, written and oral presentation: points		10	
	17.3.	Final exam: points		10	
18.	**Grading criteria**	Up to 61 points		5 (five) (F)	

	(points/grade)	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**	
20.	**Language in which lectures are conducted**	
21.	**Method for monitoring the quality of lectures**	

22. **LITERATURE**

22.1. Compulsory literature

No.	Author	Title	Publisher	Year
1.	G. Načevski	Iron and Steel Metallurgy, internal script,	Faculty of Technology and Metallurgy, Skopje	2011
2.	G. Načevski	Iron and Steel Metallurgy: Problems, internal script,	Faculty of Technology and Metallurgy, Skopje	2011

22.2. Additional literature

No.	Author	Title	Publisher	Year
1.	B. Božić	Iron and Steel Metallurgy	Nauka, Belgrade	1970
2.				
3.				