No. 2

Course syllabus for First cycle studies						
1.	**Course title**	**Physical metallurgy 1**				
2.	**Code**	MDE3M3				
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**	Second year III semester	7.	**Number of ECTS**	6	
8.	**Instructors**	Prof. Dafinka Stoevska Gogovska				
9.	**Prerequisites for course enrollment**	Physics				
10.	**Objectives of the course syllabus (competences):** Introduction to the basics of metals and alloys structure, their binary and ternary constitutional diagrams with emphasis on the iron-carbon system.					
11.	**Content of the course:** Structure of metals (structure of atoms, interatomic bonding, crystal structure), Electron theory of metals, Structure of alloys (solid solutions, intermetallic compounds and phases), Defects in the structure (vacancies, dislocations, grain boundaries), Diffusion in metals and alloys (Fick's laws, mechanisms od diffusion), Binary phase diagrams, Ternary phase diagrams, Iron-carbon diagram (metastable and stable system).					
12.	**Study methods:** Lectures and exercises, consultations, project (homework, seminar) assignments, home study (exam preparation)					
13.	**Total available time**	180 hours				
14.	**Allocation of available time**					
15.	**Teaching activities**	15.1.	Lectures	45 hours		
		15.2.	Exercises (laboratory,computation), teamwork	45 hours		
		15.3	Industrial practice	0 hours		
16.	**Other types of activities**	16.1.	Project assignments	10 hours		
		16.2.	Independent assignments	10 hours		
		16.3.	Home study	70 hours		
17.	**Grading system**					
	17.1.	Tests	80 points			
	17.2.	Seminar's work/project (presentation> written and oral)	10 points			
	17.3.	Final exam	10 points			
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.	J. S. Magdeski	Physical metallurgy 1	Internal material	2010
		2.	J. K. Mickovski	Physical metallurgy first book	University Ss Cyril and Methodius in Skopje	1999
		3.				
	22.2.	Additional literature				
		No.	Author	Title	Publisher	Year
		1.	R. Abbaschian, L.Abbaschian, R.E. Reed-Hill	Physical Metallurgy Principles, Fourth ed.	CENGAGE Learning	2004
		2.	R.E.Smallman, R.J. Bishop	Modern Physical Metallurgy and Materials Engineering, Sixth ed.	Butterworths Heinemann	1999
		3.	H. Suman	Metalografija	TMF Beograd	1989