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Course syllabus for First cycle studies					
1.	**Course title**	Discrete mathematics			
2.	**Code**	MDE3M4			
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 cycle			
6.	**Academic year / semester**	II/3	7.	**Number of ECTS**	6
8.	**Instructors**	Sonja Gegovska-Zajkova			
9.	**Prerequisites for course enrollment**	none			
10.	**Objectives of the course syllabus (competences):** The main objectives of the course are to introduce concepts of mathematical logic for analyzing propositions and proving theorems; to use sets for solving applied problems; to work with relations and investigate their properties; investigate functions as relations and their properties; to introduce basic concepts of modular arithmetic and to introduce basic concepts graphs. **Acquired skills (competences):** Upon completion of the course, the student will be able to: reason mathematically about basic data types and structures, such as sets, relations, mappings, graphs, used in computer algorithms and systems; evaluate elementary mathematical arguments and identify fallacious reasoning; model and analyze computational processes using analytic and combinatorial methods; prove elementary properties of modular arithmetic and explain their applications in cryptography and hashing algorithms; solve problems using recursive methods, apply graph models of data structures; think critically and express clearly and precisely.				
11.	**Content of the course:** Logic: propositional and predicate logic, logical equivalences, inference rules, methods of proofs. Sets, relations and their applications. Differential and difference equations. Combinatorics, generating functions, counting problems. Number theory, modular arithmetic, linear congruences, systems linear congruences and their application. Elements of graph theory.				
12.	**Study methods:** Blended teaching method: lecturing, tutorials supported by presentations and visualization of concepts, active participation of students through tests and assignments, all supported by learning management system.				
13.	**Total available time**		180 hours		
14.	**Allocation of available time**				
15.	**Teaching activities**	15.1.	Lectures-theoretical teaching		45 hours
		15.2.	Exercises (laboratory, practice classes), seminars, teamwork		45 hours
16.	**Other types of activities**	16.1.	Individual tasks		30 hours
		16.2.	Homework and self-learning		60 hours
		16.3.			

17.	**Grading system**		
	17.1.	Tests	20 points
	17.2.	Final exam	70 points
	17.3.		
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**	Attend classes regularly and take tests.	
20.	**Language in which lectures are conducted**	Macedonian and English	
21.	**Method for monitoring the quality of lectures**	Self-evaluation and surveys	

22. **LITERATURE**

22.1. Compulsory literature

No.	Author	Title	Publisher	Year
1.	Sonja Gegovska-Zajkova, Vesna Andova, Sanja Atanasova	Discrete Mathematics 1 (in Macedonian)	Faculty of Electrical Engineering and Information Technologies	2019
2.	Kenneth H. Rosen	Discrete Mathematics and its Applications	WCB/Mc Graw-Hill, 8th edition	2018
3.				

22.2. Additional literature

No.	Author	Title	Publisher	Year
1.	Sonja Gegovska-Zajkova, Vesna Andova, Sanja Atanasova	Solved Problems in Discrete Mathematics	Faculty of Electrical Engineering and Information Technologies	2019
2.				
3.				