No. 40

Course syllabus for Second cycle studies						
1.	**Course title**	Methodology of Scientific Research Work				
2.	**Code**	MDE8E6				
3.	**Study Program**	Metallurgical Digital Engineering				
4.	**Study program organizer (unit, institute, department, division)**	Faculty of Technology and Metallurgy Department of Chemical and Control Engineering				
5.	**Degree (first, second, third cycle)**	First degree				
6.	**Academic year / semester**	4/8	7.	**Number of ECTS**	6	
8.	**Instructors**	Kiril Lisichkov, PhD, Full Professor				
9.	**Prerequisites for course enrollment**					
10.	**Objectives of the course syllabus (competences):** Introducing students to the fundamentals of scientific research methodology. **Acquired skills (competences):** Understanding the scientific approach to planning and conducting experimental research using scientific methods. Employing methods for collecting and processing data from experimental research. Preparing scientific results for presentations, oral presentations, and posters, and writing scientific and professional papers. Preparing and managing scientific research projects. Applying scientific principles and methods in industrial processes.					
11.	**Content of the course:** History of science and scientific thought. Methods and phases of scientific research work. Factors in research. Selection, definition, and defense of theses. Design and implementation of scientific research. Planning and implementation of experiments. Quantitative and qualitative analysis of experimental results. Scientific research work in metallurgical processes.					
12.	**Study methods:** Lectures, exercises, homework assignments, and independent study at home					
13.	**Total available time**	180 hours				
14.	**Allocation of available time**					
15.	**Teaching activities**	15.1.	Lectures	30 hours		
		15.2.	Exercises (auditory, laboratory)	30 hours		
16.	**Other types of activities**	16.1.	Project tasks	20 hours		
		16.2.	Independent tasks	30 hours		
		16.3.	Work at home	70 hours		
17.	**Grading system**					
	17.1.	Tests		80 points		
	17.2.	Seminar project, written and oral presentation		10 points		
	17.3.	Engagement and Participation		10 points		
18.	**Grading criteria (points/grade)**	Up to 50 points		5 (five) (F)		
		From 51 to 60 points		6 (six) (E)		
		From 61 to 70 points		7 (seven) (D)		
		from 71 to 80 points		8 (eight) (S)		

		From 81 to 90 points	9 (nine) (B)
		from 91 to 100 points	10 (ten) (A)
19.	**Prerequisites for taking the final exam**	Minimum 11 points from activities 16.1 and 16.2.	
20.	**Language in which lectures are conducted**	Macedonian and English language	
21.	**Method for monitoring the quality of lectures**	Anonymous surveys	
22.	**LITERATURE**		

22.1. Compulsory literature

No.	Author	Title	Publisher	Year
1.	N. Salkind	Exploring Research: Pearson New International Edition, 8rd Edition	Pearson Education Ltd.	2013
2.	M.Camarinha-Matos Sc	Scientific research methodologies and techniques, Unit 5: Thesis organization and validation.	Cam@Uninova. Pt.	2009-2012
3.	D.Howitt, D.Cramer	Introduction to Research Methods, 3rd Edition	Pearson Education Ltd.	2010

22.2. Additional literature

No.	Author	Title	Publisher	Year
1.				
2.				
3.				