1.	Course Title	Introduction to Data Science
2.	Code	F18L3W008
3.	Study program	Software engineering and information systems
4.	Study Program Organizer	Faculty of Computer Science and Engineering
5.	Degree (first, second, third cycle)	first cycle
6.	Academic year / semester 3 / winter / optional	7. ECTS credits 6
8.	Teacher	full professor Dimitar Trajanov, full professor Ana Madevska Bogdanova, associate professor Slobodan Kalajdzhiski, associate professor Igor Mishkovski, associate professor Vesna Dimitrova, assistant professor Milosh Jovanovikj, assistant professor Kire Trivodaliev, assistant professor Eftim Zdravevski, assistant professor Georgina Mircheva
9.	Course enrollment prerequisites	Бизнис статистика или Веројатност и статистика или Основи на теорија на информации
10.	introduced to the process and m problem identification, data collectudents would know the basic tech	es): with the Data Science fundamentals and they will be ethodologies for operations with data, starting from etion and data processing. At the end of the course niques for data processing and pattern recognition in the v to visualize the results and properly interpret them.
11.	and problem identification (2) Coll	s a fourth science paradigm (2) Designing experiments ecting data and data processingСобирање и обработка Pattern recognition in the data (2) Explanation of the testing and feedback
12.	Learning methods: Lectures using presentations, interactions	active lectures, exercises (using equipment and software

13. Total available time		packages), teamwork, case studies defense of a project assignment and			ndepende	ent preparation	ı and	
15.1 Lectures — theoretical 30 hours teaching 15.2 Exercises (laboratory, 45 hours auditory), seminar papers, teamwork 16.1 Project Tasks 15 hours 16.2 Independent Learning 15 hours 16.3 Home learning 75 hours 17.1 Tests 0 points 17.2 Seminar paper/project (presentation: written and oral) 20 points 17.3 Activity and learning 15 points 17.4 Final exam 65 points 17.4 Final exam 65 points 17.5 16 points 6 (six) (E) 61 to 70 points 7 (seven) (D) 71 to 80 points 9 (nine) (B) 91 to 100 points 9 (nine) (B) 91 to 100 points 10 (ten) (A) 19 Course completion and final exam Realized activities 15.1 and 15.2 10 Teaching quality evaluation method Internal evaluation mechanisms 15 10 10 10 10 10 10 10	13.	Total available time		6 ECTS x 30 hou	rs = 180	hours		
teaching 15.2. Exercises (laboratory, 45 hours auditory), seminar papers, teamwork 16. Other activity forms 16.1. Project Tasks 15 hours 16.2. Independent Learning 15 hours 16.3. Home learning 15 hours 17.4. Seminar paper/project (presentation: written and oral) 17.5. Activity and learning 17.6. Seminar paper/project (presentation: written and oral) 17.6. Final exam 17.7. Final exam 18. Assessment criteria (points/grade) 18. Assessment criteria (points/grade) 19. Course completion and final exam Realized activities 15.1 and 15.2 19. Course completion and final exam Realized activities 15.1 and 15.2 10. Teaching Language 10. Teaching quality evaluation method 10. Internal evaluation mechanisms questionnaires 10. Internal evaluation mechanisms questionnaires	14.	Distribution of the available time		30 + 45 + 15 + 15	5 + 75 =	180 hours		
auditory), seminar papers, teamwork 16. Other activity forms 16.1. Project Tasks 15 hours 16.2. Independent Learning 15 hours Tasks 16.3. Home learning 75 hours 17. Assessment methodology 17.1. Tests 0 points 17.2. Seminar paper/project (presentation: written and oral) 17.3. Activity and learning 17.4. Final exam 65 points 18. Assessment criteria (points/grade) 18. Assessment criteria (points/grade) 19. Course completion and final exam requirements 20. Teaching Language Macedonian and English Internal evaluation mechanisms questionnaires 22. Course Material	15.	Teaching activity forms	15.1.		eoretical	30 hours		
16.2. Independent Learning 15 hours Tasks 16.3. Home learning 75 hours Tasks 16.3. Home learning 75 hours Tasks 16.3. Home learning 75 hours Tasks 17.1. Tests 0 points Tasks 17.2. Seminar paper/project (presentation: written and oral) 20 points Tasks 17.3. Activity and learning 15 points Tasks 17.4. Final exam 65 points Tasks 17.5. Activity and learning 15 points Tasks 17.6. Final exam 15 points Tasks 17.8. Activity and learning 15 points 15 points Tasks 17.8. Activity and learning 15 points 15 points 15 points 15 points 15 points 17.8. Activity and learning 15 points 15 points 17.8. Activity and learning 15 points 15 points 15 points 17.8. Activity and learning 17.8. Activity and learning 15 points 15 points 17.8. Activity and learning 15 points 15 points 15 points 17.8. Activity and learning 17.8. Activity and learning 15 points 17.8. Activity and learning 17.8. Activity and learning 15 points 17.8. Activity and learning 17.8. Activity and learning 15 points 15 points 17.8. Activity and learning 17.8. Activity and learning 17.8. Activit			15.2.	auditory), seminar				
Tasks 16.3. Home learning 75 hours	16.	Other activity forms	16.1.	Project Tasks		15 hours		
17. Assessment methodology 17.1. Tests 17.2. Seminar paper/project (presentation: written and oral) 17.3. Activity and learning 17.4. Final exam 18. Assessment criteria (points/grade) 18. Assessment criteria (points/grade) 18. Assessment criteria (points/grade) 19. Course completion and final exam requirements 19. Course completion and final exam Realized activities 15.1 and 15.2 19. Teaching Language 10 points 15 points 15 points 15 points 16 (six) (E) 17.1. Tests 18. Assessment criteria (points/grade) 19. Teaching Language 10. Teaching quality evaluation method			16.2.		Learning	15 hours		
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17.3. Activity and learning 17.4. Final exam 18. Assessment criteria (points/grade) 18. Assessment criteria (points/grade) 18. Assessment criteria (points/grade) 19. Course completion and final exam requirements 10. Teaching Language 15 points 16 (six) (F) 11 to 80 points 10 (ten) (A) 12. Course completion and final exam requirements 15 points 16 (six) (F) 17. To 80 points 18. Assessment criteria (points/grade) 19. Course goints 10 (ten) (A) 19. Course completion and final exam requirements 10 (ten) (A) 11 Teaching Language 12 Macedonian and English 13 points 14 (six) (F) 15 to 60 points 16 (six) (F) 17 to 80 points 19 (nine) (B) 10 (ten) (A) 19 Teaching Language 10 Macedonian and English 11 Teaching quality evaluation method 12 Internal evaluation mechanisms questionnaires			0 points					
17.4. Final exam 18. Assessment criteria (points/grade) up to 50 points 5 (five) (F) 51 to 60 points 6 (six) (E) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (eight) (C) 81 to 90 points 9 (nine) (B) 91 to 100 points 10 (ten) (A) 19. Course completion and final exam requirements 20. Teaching Language Macedonian and English 21. Teaching quality evaluation method Internal evaluation mechanisms questionnaires 22. Course Material		17.2. Seminar paper/project (presentation: written and oral)				20 points		
18. Assessment criteria (points/grade) up to 50 points 5 (five) (F) 51 to 60 points 6 (six) (E) 61 to 70 points 7 (seven) (D) 71 to 80 points 8 (eight) (C) 81 to 90 points 9 (nine) (B) 91 to 100 points 10 (ten) (A) 19. Course completion and final exam requirements 20. Teaching Language Macedonian and English 21. Teaching quality evaluation method Internal evaluation mechanisms questionnaires 22. Course Material		17.3. Activity and learning		15 points				
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22. Course Material	21.				ition	mechanisms	and	
22.1. Mandatory course material	22.	•						
		22.1. Mandatory course material						

	No	Author	Title	Publisher	Year			
	1	Jeffrey S. Saltz and Jeffrey M. Stanton	An Introduction to Data Science	SAGE Publications	2017			
	2	Igual, Laura, Seguí, Sant	Introduction to Data Science: A Python Approach to Concepts, Techniques and Applications	Internationa Publishing	2017 al			
	3	Jake VanderPlas	Python Data Science Handbook: Essential Tools for Working with Data	O'Reilly	2017			
22.2.		Additional course material						
	No.	Author	Title		ublisher	Year		