

Attachment no. 3		Course program of the first, second and third cycle of studies			
1.	Course title	MODERN INSTRUMENTAL METHODS AND TECHNIQUES FOR FOOD ANALYSIS			
2.	Code	ITHN-17			
3.	Student program	<i>Innovative technologies on food and nutrition</i>			
4.	Organiser of the student program (unit, institute, department)	Faculty of Technology and Technical Science			
5.	Degree (first, second, third cycle)	Third cycle			
6.	Academic year/ semester	1 / II	Number of ECTS credits	5	
8.	Professor	Vonr.prof.d-r Gorica Pavlovska Vonr.prof.d-r Valentina Pavlova D-r Mirjana Menkovska Doc.d-r Tatjana Kalevska			
9.	Preconditions for enrolling on the course	II (second) cycle of studies			
10.	Objectives of the course program (competences)	Students will deepen their knowledge about food analysis and will gain new knowledge about advanced instrumental methods that are used in food analysis, their upgrade and data processing.			
11.	Contents of the course program	<ul style="list-style-type: none"> - Preparation of the sample depending on its origin and method of analysis - Spectroscopic methods UV/VIS, Fluorescence spectroscopy, FT- NIR, MS, NMR - Chromatographic methods: GC-MS, GCxGC, LC –MS (Optimization of mobile phases characteristic for components which are present in food, column selection), Capillary electrophoresis, Selected types of gel filtration and ion exchange - Processing data from instrumental analyses 			
12.	Methods of studying				
13.	Total available time fund	150			
14.	Distribution of the available time	50 + 30+30+20+20= 150			
15.	Forms of teaching activities	15.1	Lectures- theoretical instruction	50	
		15.2	Exercises (laboratory, auditorium), seminars, teamwork	30	
16.	Other forms of activities	16.1	Project exercises	30	
		16.2	Independent exercises	20	
		16.3	Home studying	20	
17.	Methods of assessment				
	17.1	Tests: 2 exams during the teaching process or written exam with duration of 2 hours	80		

	17.2	Seminar work / project, presentation written and oral			10	
	17.3	Activity and participation			10	
18.	Assessment 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) (C)	
				from 81 to 90 points	9 (nine) (B)	
				from 91 to 100 points	10 (ten) (A)	
19.	Condition for getting a signature and taking the final exam					
20.	Teaching language			Macedonian (if there is a necessity it can be taught in English)		
21.	Method of monitoring the quality of teaching					
22.	Literature					
	22.1	Compulsory literature				
		Number	Author	Title	Publisher	Year
		1.	F.Rouessak, A.Rouessak	<i>Chemical Analysis Modern Instrumentation Methods and Techniques</i>	Johan Wiley&Sons,Ltd	2007
		2.	R.E. Andrey	Liquid Chromatography – Mass Spectrometry: An Introduction	Wiley	2003
		3	N.N Haris,	<i>Quantitative Chemical Analysis</i>	Freeman	2002
	22.2	Additional literature				
		Number	Author	Title	Publisher	Year
1.						
2.						