

Attachment no. 3		Course program of the first, second and third cycle of studies			
1.	Subject	<b>ROBOTICS IN FOOD TECHNOLOGY</b>			
2.	Code	<b>ITHN - 33</b>			
3.	Study Program	<i>Innovative technologies on food and nutrition</i>			
4.	Study Program organized	Faculty of Technology and Technical Science- Veles			
5.	Degree of study	PhD			
6.	Academic year/ semester	1 / II	7.	Number of EKT credits	5
8.	Professor	Prof. d-r. Vesna Antoska Knights			
9.	Precondition for taking the subject	Postgraduate studies completed			
10.	<p><b>Objectives/Competence:</b> The purpose of the course is to familiarise students with the basic structure of robots, actuators, robot kinematics, dynamics, the structure of programming languages for robot management and basic robotic intelligence. The student acquires competence in the application of the principles of artificial intelligence, such as fuzzy logic and neural networks in the food industry. Experience the application of robots in certain food technologies.</p>				
11.	<p><b>Program Content:</b> Introduction to robotics: basic concepts, definitions, classifications, development, examples and applications of robots (current and future) in the food industry. Special and necessary conditions for the robot in the food industry. The basic principles of hardware and software performance of the robot. Kinematic and dynamic model of the robot. Planning and managing the robot. Intelligent sensing recognition systems and feelings of touch and strength. Robots with artificial intelligence. Robots as workers in a food technology factory.</p>				
12.	Methods of learning: Lectures, interactive classes, project assignments, presentations, teamwork, independent preparation and defense of a project assignment.				
13.	Time fund	5 x 30 = 150 hours			
14.	Time distribution	20+10+20+50+50=150			
15.	Teaching activities	15.1.	Lectures - Theory	20 hours	
		15.2.	Exercises (Laboratory, audio), Seminars, Team work	10 hours	
16.	Other forms of activities	16.1.	Projects	20 hours	
		16.2.	Independent tasks	50 hours	
		16.3.	Home learning	50 hours	

17.	Way of estimation the results				
17.1.	Tests/oral exam			60 points	
	Seminars/ Project (presentation: written and oral)			40 points	
17.3.	Activity/Participation in discussions			points	
18.	Evaluation Criteria (points/ grades)		Up to 50points	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.	Precondition for going to final exam		Seminar		
20.	Language of teaching		Macedonian, English		
22.	References				
	References (obligatory)				
	No.	Author	Title	Publisher	Year of publishing
	1	J. Craig:	<i>Introduction to Robotics: Mechanics and Control</i>	Pearson Education, Inc,(3rd Edition), Prentice Hall	2005
22.1.	2.	Saeed B.Niku	<i>Introduction to Robotics Analysis, Systems, Applications</i>	Prentice Hall	2001
	3.	Emanuele Trucco, Alessandro Verri:	<i>Introductory Techniques for 3-D Computer Vision,</i>	Prentice Hall	1998
	References (additional)				
	No.	Author	Title	Publisher	Year of publishing
		Ed.: H.N. Teodoroescu, A. Kandel, L.C. Jain.	<i>Soft Computing in human-related sciences,</i>	T. J. Ross, Fuzzy Logic with Engineering Applications, 2nd Ed., Wiley	2004