

Attachment no. 3		Course program of the third cycle of studies			
1.	Course title	FOOD CONTACT MATERIALS, NOVEL PACKAGING SYSTEMS AND TRENDS IN FOOD INDUSTRY (ADVANCED LEVEL)			
2.	Code	ITHN - 15			
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 -Veles			
5.	Degree (first, second, third cycle)	Third cycle			
6.	Academic year/ semester	1 / I	7.	Number of ECTS credits	5
8.	Professor	Vonr.prof.d-r Anka Trajkovska Petkoska Vonr.prof. d-r Ilija Nasov			
9.	Preconditions for enrolling on the course	/			
10.	Objectives of the course program (competences):	Competences in materials used in food processing industry and packaging materials that are in contact with food. Materials-food interactions. Novel trends in food processing and food packaging. Nanostructured and engineered materials as food contact materials.			
11.	Course content:	The importance and role of materials in food processing industry. Packaging materials, metal and nonmetal materials, glass, polymers, paper, wood, textile... Biodegradable ambalage materials, Eco-aspects for packaging materials. Interaction between food and packaging materials as well as materials for food processing equipment. Methods and properties and methods for testing of packaging materials. Nanomaterials as food contact materials: advantages and disadvantages; food safety aspects. Modified nanostructured materials as food contact materials (nano-dopants and additives in food products, nanocoatings in food processing equipment, nanomodified packaging materials. New trends in food packaging (active, intelligent, smart packaging).			
12.	Methods of studying:				
13.	Total available time fund	150 classes			
14.	Distribution of the available time	50 +30+30 +10+30=150			
15.	Forms of teaching activities	15.1.	Lectures- theoretical instruction	50 classes	
		15.2.	Exercises (laboratory, auditorium), seminars, teamwork	30 classes	
16.	Other forms of activities	16.1.	Project exercises	30 classes	
		16.2.	Independent exercises	10 classes	
		16.3.	Home learning	30 classes	
17.	Methods of assessment				
	17.1.	Tests			80 points
	17.2.	Seminar work / project, presentation written and oral			10 points
	17.3.	Activity and participation			10 points
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		
21.	Method of monitoring the quality of teaching		

22.	Literature				
	Compulsory literature				
	Number	Author	Title	Publisher	Year
22.1.	1.	Jung Han	Innovations in Food Packaging	Elsevier Science & Technology Books	2005
	2.	RICHARD COLES, DEREK MCDOWELL, MARK J. KIRWAN	Food Packaging Technology	Blackwell Publishing Ltd	2003
	3.	Gordon L. Robertson	Food Packaging and Shelf Life	Taylor and Francis Group, LLC	2010
	4.	Martin Forrest	Food contact materials- Rubbers, Silicones, Coatings and Inks	Smithers Rapra	2009
	5.	Lynn J. Frewer, Willem Norde, Arnout Fischer, and Frans Kampers	Nanotechnology in the Agri-Food Sector	Wiley-VCH Verlag GmbH & Co. KGaA	2011
	6.	S. Clark, S. Jung, B. Lamsal	Food Processing- Principles and Applications, IInd Ed.	John Willey&Sons Ltd.	2014
	Additional literature				
	Number	Author	Title	Publisher	Year
22.2.	1.	JOSEPH KERRY, PAUL BUTLER	Smart Packaging Technologies for Fast Moving Consumer Goods	John Wiley & Sons Ltd	2008
	2.	John R. Wagner, Jr	Multilayer flexible packaging	Elsevier Inc.	2010
	3.	N.A. Michael Eskin et. al.	Food Shelf Life Stability	CRC Press LLC	2001
	4.	Laurier L. Schramm	Emulsions, Foams, and Suspensions, Fundamentals and Applications	WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim	2005
	5.	Alan Kin-Tak Lau, Farzana Hussain, Khalid Lafdi	Nano- and Biocomposites	Taylor and Francis Group, LLC	2010
	6.	Jean-Maurice Vergnaud and Iosif-Daniel Rosca	Assessing Food Safety of Polymer Packaging	Smithers Rapra Limited	2006