MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB), INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY**

Program: B.Sc. (Food Science and Technology)

COURSE ARTICULATION MATRIX (STUDY SCHEME: 2018)

Subject	S Code	Semester	Credit	Duration (Hrs)	L T P	COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
General Microbiology	BFOTS1-101	1	4	60	3 1 0	CO1	**CO1** Understanding the various theories related to growth of micro-organisms and their disease causing abilities	3												2			
						CO2	**CO2** Remembering the general characteristics of micro-organisms in relation to their effect on plant and human health.		3											2			
						CO3	**CO3** Selection of suitable tools, equipments and environmental conditions for the growth of micro-organisms.					3										3	
						CO4	**CO4** Identifying the appropriate method for the control of micro-organisms that result in food preservation.		3													2	
						CO5	**CO5** Creating the ability to communicate with food science community and society about the merits and demerits of micro-organisms.										3				3		

Introduction to Food Technology	BFOTS1-102	1	4	60	31 0	CO1	**CO1.** Creating awareness about various disciplines of food science and technology and their applications in food production and preservation.	**3**		**1**									**3**			
						CO2	**CO2.** Understanding about selection of appropriate techniques for the production of nutrient dense foods with reduced toxicity.			**1**		**2**										**3**	
						CO3	**CO3.** Acquire knowledge about compositional and nutritional properties of different cereal grains that aids in the production of different food products.			**3**									**1**		**2**	
						CO4	**CO4.** Identifying problems related to the degradation of fats and their solutions that results in preservation.				**3**											**3**
						CO5	**CO5.** Imparting knowledge about various physical and chemical changes occur during processing	**3**											**1**			**1**
Mathematics	BFOTS1-103	1	4	60	31 0	CO1	**CO1.** Imparting knowledge about basics of mathematics that helps the students with biology background in understanding food engineering	**2**											**2**			
						CO2	**CO2.** Developing an ability to understand the use of calculations and numerical in solving problems related to processing and preservation.		**3**										**2**			
						CO3	**CO.3** Engaging students in life-long learning by creating a linkage between mathematics and food sciences											**3**		**1**		
Computer Science and Applications	BFOTS1-104	1	4	60	31 0	CO1		60	31 0										**3**			
						CO2	**CO.2** Creating an ability to identify problems related to security against computer viruses along with their preventive measures.		**3**													**1**
						CO3	**CO.3** Creating an ability to communicate effectively with attractive presentations and report writing with society.									**3**				**3**		
						CO4	**CO.4** Providing knowledge about collection, storage and analysis of data with minimum human errors.				**3**								**2**			

						CO5	**CO.5** Developing the management skills by imparting knowledge about applications of computers in management of data in every field											**3**			**2**		**2**
General Microbiology Lab-I	BFOTS1-105	1	2	30	004	CO1	**CO.1** Understanding about working of different equipment's of microbiology and their applications in food production and preservation.			**2**		**3**										**3**	
						CO2	**CO.2** Imparting knowledge about practical handling of microbiological tools that ensures safety of food products.					**1**	**2**									**2**	
						CO3	**CO.3** Enumeration of microbial load of different food products with suitable techniques and interpret the factors associated with them.				**3**												**2**
						CO4	**CO.4** Selection of suitable methods for the cultivation, isolation and storage of micro-organisms that can be beneficial for human health and environment.					**2**		**2**								**2**	
						CO5	**CO.5** Creating ability to work effectively both individually and as a team during the collection of samples from different sources.									**3**						**3**	
Life Sciences	BPHARO-002	1	4	60	31 0	CO1	**CO.1** Providing knowledge about various cell organelles to the students from non-biology background that helps them in understanding the need of nutrition for health.	**3**												**1**			
						CO2	**CO.2** Understanding the physiology and anatomy of human body that create an ability to develop foods as for allergic			**3**												**2**	
						CO3	**CO.3** Identifying the micro-organisms responsible for infectious and contagious diseases along with their preventive measures		**3**														**3**
						CO4	**CO.4** Creating an ability of developing vaccines and antibiotics that can be beneficial for society and environment.							**3**								**2**	
						CO5	**CO.5** Applying genetic engineering in food and human health that can support agro-food industries											**3**			**3**		
Communi cative	BHUMAO-001	3	0	45	300	CO1	**CO.1** Recognizing the need of command over the communicative skills engage students in independent and life-long learning.												**3**		**3**		

						CO2	**CO.2** Creating an ability to communicate effectively with food science community and the society with effective report writing and presentations.										**3**				**2**		
						CO3	**CO.3** Engaging students in team work by organizing group discussions on different topics.										**3**				**2**		
						CO4	**CO.4** Increasing the probability of employment in a reputed industry or organization by improving the interview skills.											**1**	**2**		**2**		
						CO5	**CO.5** Creating an ability to identify problems and solutions by improving the listening skills of the students.		**3**														**3**
Introduction to Food Technology II	BFOTS1-201	2	4	60	31 0	CO1	**CO.1** Identifying the problems arise during storage of fruits and vegetables and resolve them by basic and advanced tools.		3														3
						CO2	**CO.2** Understanding the compositional and nutritional properties of fruits and vegetables that results in the production of value-added food products.	2												3			
						CO3	**CO.3** Applying ethical principles during the handling of animals before processing and preservation of animal products.							3						2			
						CO4	**CO.4** Creating the knowledge about overview of general processing methods of Indian spices and their therapeutic uses.					3								1		1	
						CO5	**CO.5** Imparting the knowledge regarding usages of appropriate techniques for the quality evaluation of various food products.					3										2	2
Principles of Food Preservation	BFOTS1-202	2	4	60	31 0	CO1	**CO.1** Imparting the knowledge regarding various methods of preservation of food and their effect on physiochemical properties of food.			3			2							3			
						CO2	**CO.2** Selecting appropriate equipment's for preservation of different food products with an objective of minimal degradation of nutrients.					3										3	
						CO3	**CO.3** Synthesize information for freezing and drying of different food products with the use of freezing and drying curves.				2											2	

						CO4	**CO.4** Identifying the problems associated with food spoilage and selection of suitable methods of preservation		3														3
						CO5	**CO.5** Creating the awareness about the effect of chemical and physical preservation techniques on health and nutritional components of food.	1					3									2	
Environmental Studies	BFOTS1-203	2	3	45	300	CO1	CO.1 Creating the awareness about the multidisciplinary nature of environmental studies that promotes individual and team work to resolve issues related to depletion of natural resources.	2								3					3		
						CO2	CO.2 To engage students in various environmental activities that promotes the life-long learning.											3			1		
						CO3	CO.3 Understanding the concept of ecosystem and its role in sustainable development.							3					1				
						CO4	CO.4 Identify the problems associated with environmental pollution and design effective solutions in context to society and health.		3		2												2
						CO5	CO.5 Creating an ability to communicate effectively about the problems of environment degradation and solutions for conservation with society at large.				2					3				1		
Food Chemistry	BFOTS1-204	2	2	30	004	CO1	**CO.1** Understanding the chemical structure of food components in relation to shelf life and nutritional value of food products	3											3				
						CO2	**CO.2** Identifying the suitable methods for the production of novel food products.				3										3		
						CO3	**CO.3** Imparting the knowledge of physicochemical properties of food among students.	2											3				
						CO4	**CO.4** Creating the awareness about the functions of various food components.							2							2		
						CO5	**CO.5** Remembering the concept of minerals and vitamins associated with human health for various life long benefits.						3								1		

Introduction to Food technology Lab II	BFOTS1-206	1	2	30	004	CO1	**CO.1** Imparting the knowledge of basic instruments used in food industry for analysis of various components of food.	3	0	0	0	0	2	0	0	0	0	0	0	2			
						CO2	**CO.2** Performing various test for chemical analysis of food.	0	0	0	0	2	2	0	0	0	0	0	0			1	
						CO3	**CO.3** Understanding the effects of hydrothermal processes on produce.	0	0	2	0	0	2	0	0	0	0	0	0				2
						CO4	**CO.4** Conduct test for qualitative analysis of various food components.	0	0	0	0	0	2	0	0	0	3	0	0			1	2
						CO5	**CO.5** Collection of data from various quality assessment methods and their interpretation into valid conclusions																
Principles of Food Preservation Lab-III	BFOTS1-205	2	2	30	004	CO1	**CO.1** Preparation of value added products using various fruits and vegetables.			3												2	
						CO2	**CO.2** Understanding the effects of hydrothermal processes on different vegetables.		2													2	
						CO3	**CO.3** Performing the analysis of various packaged food.					3											3
						CO4	**CO.4** Applying different food preservation techniques for preservation of various food.					3	1									3	
							CO5 Gaining practical knowledge of various instruments used in food processing industry	3														3	
Dairy Technology		3	4	60	310	CO1	**CO.1** Understanding the physical, chemical and nutritive value of milk for processing of liquid milk and as raw material for the production of various milk products as per the legal standards specified by various agencies.	**1**					**3**							**3**		**2**	
						CO2	**CO.2** Creating awareness about selection of equipment's for the processing and quality assessment of milk and milk products					**3**										**3**	**2**
						CO3	**CO.3** Identifying the various defects arise during processing and storage of milk and milk products along with the causes behind these defects.		**2**														**3**

						CO4	**CO.4** Development of fermented milk and milk products with the selection of appropriate micro-organisms having some therapeutical effects.			**2**			**2**									**3**	
						CO5	**CO.5**Creating ability to communicate efficiently with the developing milk processing industries and help them to manage projects by resolving their issues											**3**				**2**		
Technology of Fruits and Vegetables	MFOT1-314	3	4	60	310	CO1	**CO.1** Developing the ability to check the maturity of fruits and vegetables along with its suitability for processing into value added food products		**1**	**2**												**3**	
						CO2	**CO.2** Understanding quality analysis of fruits and vegetables along with the factors affecting processing and interpret valid conclusions for effective preservation of food products.		**1**	**2**	**3**												**3**
						CO3	**CO.3** Identifying the problems related to spoilage of fruit and vegetable products and use of preservatives along with processing techniques to prevent spoilage		**3**														**3**
						CO4	**CO.4** Creating ability to utilize the fruit and vegetable industry waste to reduce the environmental stress.			**2**				**3**								**2**	
							CO.5 Selection of suitable techniques for the production of food products with enhanced shelf life and minimal degradation of nutrients.			**3**		**1**										**3**	
Food Microbiology and Food Safety		3	4	60	310	CO1	**CO.1** Understanding the role of micro-organisms in production and spoilage of raw along with processed food.		**3**												**3**		
						CO2	**CO.2** Identifying the enumeration methods for micro-organisms and implementation of different preservative methods in combination to preserve food.			**2**	**3**											**3**	
						CO3	**CO.3** Collecting knowledge regarding microbial quality of raw, processed and spoiled foods and interpret that in context to public health.				**3**		**2**									**2**	
						CO4	**CO.4** Creating awareness regarding applications of various food safety tools for the production of safe food meeting the legal standards.					**3**	**2**									**3**	

							CO.5 Analyzing the nature of various food safety hazards and control them to ensure environmental sustainability							**3**							**2**		**2**
Dairy Technology Lab-IV	MFOT1-363	3	2	30	004	CO1	**CO.1** Collecting data from different platform tests and implementing the information to ensure suitability of raw material for processing.				**3**										**1**		**2**	
						CO2	**CO.2** Applying standard protocols for the production of safe milk and milk products meeting the legal specifications.						**3**										**3**	
						CO3	**CO.3** Creating ability to determine the quality of milk and milk products and ensuring their safety for human consumption with certain limitations.						**2**										**2**	**3**
						CO4	**CO.4** Understanding the working and applications of various dairy equipments in milk processing.					**3**											**3**	
							CO.5 Developing the spirit of individual and team work by familiarizing the students with industrial environments								**3**							**3**		
Technology of Fruits and vegetables Lab V		3	2	30	004	CO1	**CO.1** Applying theoretical knowledge for the production of value added products meeting the specified needs of society			**2**			**3**									**3**	
						CO2	**CO.2** Evaluating the quality of food products using basic and advanced equipments.					**3**												**3**
						CO3	**CO.3** Developing food preserves to enhance the shelf life along with reduction in wastage of perishable foods			**3**				**1**									**1**
						CO4	**CO.4** Reducing environmental stress by utilizing by-products of fruit and vegetable industry by converting them into attractive food products.			**2**				**3**								**2**	
							CO.5 Creating an ability to share views related to a food industry and their management during industrial visits									**3**					**3**		
Food Microbiology and Food Safety Lab VI		3	2	30	004	CO1	**CO.1** Understanding the use of various equipments of microbiology and their applications in food safety.					**3**										**3**	
						CO2	**CO.2** Creating an ability to identify different micro-organisms and relate their characterstics with the safety of human and plant health.			**2**												**3**	

						CO3	**CO.3** Applying appropriate methods to analyze the microbial safety of food products and implement that information to determine the efficiency of preservation methods.				**2**	**2**										**3**
						CO4	**CO.4** Creating skill for development of fungal and fermented foods reducing stress on environment to fulfill the need of nutrient rich foods for growing population			**3**				**3**							**1**		**1**
							CO.5 Identifying the problems associated with spoilage of raw and processed foods due to different micro-organisms and applying suitable preservation methods.		**3**														**3**
Entrepreneurship		3	3	45	300	CO1	CO.1 Understanding the basic concepts of Entrepreneur, Entrepreneurship and Enterprise in relation to food Industry.	**2**														**3**		
						CO2	CO.2 Developing entrepreneurial skills in the students and ability to communicate effectively on the issues of an Entrepreneur and Entreprisewith the food science community.										**3**	**1**			**3**		
						CO3	CO.3 Developing a spirit of individual and team work by teaching them with the help of case studies of successful entrepreneurs.									**2**					**3**		
						CO4	CO.4 Creating an ability to identify opportunities in business and generation of unique business ideas.		**3**														**1**
							CO.5 Applying the principles of management to manage projects as individual and team.									**2**		**1**			**2**		
Food Fermentation Technology		3	3	45	300	CO1	**CO.1** Applying the knowledge of microbiology for the production and preservation of food products.	**1**		**2**											**3**			
						CO2	**CO.2** Understanding the working of various fermenters for the production of healthy food with increased palatability.					**3**									**3**		
						CO3	**CO.3** Reducing the stress on environment with the production of organic acids and vitamins by using micro-organisms and utilizing industrial waste							**3**								**3**	

						CO4	**CO.4** Creating an awareness about the quality assessment of raw material and its usage for the production of safe and healthy food products.			**3**												**1**	**2**
							CO.5 Selecting suitable type of fermentation for the production of specific product and interpret the whole information related to the specific product for efficient recovery.				**2**											**2**	**1**
Food Additives		3	3	45	300	CO1	**CO.1** Understanding the general characteristics of various food additives and their application in improvement of physical and chemical properties of food	3													**3**			
						CO2	**CO.2** Collecting basic knowledge regarding the mechanism of action of various additives and utilize it for the production of healthy food products with enhanced shelf life.			**3**												**2**	
						CO3	**CO.3** Creating awareness about different techniques for the processing, preservation and extraction of essential oils from various Indian spices.					**3**										**3**	
						CO4	**CO.4** Understanding the importance of legal standards specified for the use of additives and applying that knowledge for the production of safe and healthy food products.						**3**									**3**	
Drug Abuse		3	0	30	200	CO1	**CO.1** Creating an awareness about problems of drug abuse by proving a comfortable environment in class that engage students in life-long learning.												**3**		**2**			
						CO2	**CO.2** Understanding the concept of drug dependence, addiction and tolerance along with their solutions develops a passion to work for the wellness of society.						**1**						**1**		**1**			
						CO3	**CO.3** Creating an ability to communicate effectively on various long term and short term effects of drug abuse.										**3**				**1**			
						CO4	**CO.4** Encouraging individual and team work by creating awareness about the consequences of drug abuse and their effect on individual, parents and society									**3**					**2**			

							CO.5 Imparting moral values to the students that aids in the development of an individual and society.								**3**						**2**		
Technology of Cereals, Pulses and Oilseeds		4	4	60	310	CO1	**CO.1** Understanding the structure and composition of different cereal grains and their effect on the quality of processed food.	3												3			
						CO2	**CO.2** Identifying the suitable methods for the processing of cereal and their conversion into different food products.			3	2											3	
						CO3	**CO.3** Remembering the concept of conversion of cereal grain in value added product and their application related with human health.						3									3	
						CO4	**CO.4** Imparting basic knowledge of physiochemical properties of different cereals and their effect on processing of food.	3															2
							CO.5 Acquiring the knowledge of development of food products and processes using cereal grains.			3		2										2	
Egg, Poultry and Meat Technology	MFOT1-418	4	4	60	310	CO1	**CO.1** Providing the knowledge of structure and composition of different meat and meat products.	3												3			
						CO2	**CO.2** Understanding the techniques used for conversion of eggs into different products and their impact on different food components.			3				2								3	
						CO3	**CO.3** Applying the ethical principles during handling of animal and their conversion into meat for developing different meat products.								3					2			
						CO4	**CO.4** Imparting the knowledge of different quality evaluation methods for meat and meat products.	3				3											2
							CO.5			2				1									
Food Plant Hygiene and Sanitation	MFOT1-418	4	4	60	310	CO1	**CO.1** Understanding the concept and importance of personal hygiene and its role in food safety.				3									2			
						CO2	**CO.2** Familiarizing the students with different types of byproduct utilization and their application in various fields.					3										1	

						CO3	**CO.3** Creating the knowledge of different waste disposal and its treatment by various physical and chemical agents.					2											1
						CO4	**CO.4** Applying distinctive methods of cleaning and sanitation to maintain industrial hygiene.	3			1										2		
							CO.5 Aware the students about design and layout of effluent treatment plant used in various food industry.			3		2									1		1
Technology of Cereals, Pulses and Oilseeds Lab VII	MFOT1-418	4	2	30	004	CO1	**CO.1** Understanding the concept and importance of personal hygiene and its role in food safety.				3											2	
						CO2	**CO.2** Familiarizing the students with different types of byproduct utilization and their application in various fields.					3										3	
						CO3	**CO.3** Creating the knowledge of different waste disposal and its treatment by various physical and chemical agents.					2								2			
						CO4	**CO.4** Applying distinctive methods of cleaning and sanitation to maintain industrial hygiene.	3			1												3
							CO.5 Aware the students about design and layout of effluent treatment plant used in various food industry.			3		2										3	
Egg, Poultry and Meat Technology	MFOT1-418	4	2	30	004	CO1	**CO.1** Conducting various tests required for grading and quality evaluation of different meat and meat products.				3											2	
						CO2	**CO.2** Preservation of meat products by using appropriate preservation methods.		3													2	
						CO3	**CO.3** Development of numerous meat and meat products by suitable methods to meet specified needs of the public health.			2			2										2
						CO4	**CO.4** Familiarize students about ethical principles during slaughtering and dressing of meat for the conversion of muscles into meat								3					2			
							CO.5 Imparting the concept and practical knowledge of different meat processing operation from farm to folk.					2		2								2	

Food Plant Hygiene and Sanitation	MFOT1-418	4	2	30	004	CO1	**CO.1** Understanding the working and principles of various equipments used to determine the safety of food.					3										2		
						CO2	**CO.2** Imparting knowledge regarding safety standards of various food products along with their analysis.					2	2									2	2	
						CO3	**CO.3** Identifying various problems related to food safety with the help of appropriate techniques and conclude their solutions		3													2		
						CO4	**CO.4** Developing the spirit of team work during sample collection from various sites in the university.									3					3			
							CO.5 Understanding the impact of different processing techniques on water and environment.							3								2		
Nutraceutical and Functional Foods	MFOT1-418	4	4	60	400	CO1	**CO.1** Understanding the concept of nutraceutical and functional food and their associated health benefits.	3					2							2				
						CO2	**CO.2** Familiarize the students about thefunctionsof various types of nutraceutical compounds, sources and their rolein promoting human health						3									2		
						CO3	**CO.3** Creating the knowledge of various sources of function foods and their potential for use in improving human health.			3											2			
						CO4	**CO.4** Imparting the knowledge of fermented foods and their role in various harmful diseases.	2			1									1		2		
						CO5	**CO.5** Aware the students about the future prospects of various health promoting foods and their potential for use in promoting human health.		2				2									2		
Nutraceutical and functional foods Lab X	MFOT1-418	4	2	30	004	CO1	**CO.1** Creating the ability to understand about variousnutraceuticalsandfunctionalfood savailableinthemarket and their associated health benefits.	3														2		
						CO2	**CO.2** Familiarize the students with the approach behind development of nutraceuticals and functional foods.			2			3									2		
						CO3	**CO.3** Aware the students about analysis of compounds responsible for imparting nutraceutical properties to the food product.				3												2	

						CO4	**CO.4** Imparting the knowledge about formulation and development ofvarious nutraceutical andfunctionalfoods.			3										1		2	
						CO5	**CO.5** Applying various estimation techniquesto determine differentcomponents presentin food.					3											3	
Bakery Technology	MFOT1-418	4	4	60	400	CO1	**CO.1** Familiarize the students with current scenario and economic importance of BakeryIndustry in India.	3												2			1
						CO2	**CO.2** Aware the students with different categories of bakery products and their possible uses.	2					3							2			
						CO3	**CO.3** Understanding the concept and techniques required for formulation of different bakery products.			3												3	
						CO4	**CO.4** Impart the knowledge of different ingredients used and their role in the bakery products formulation					3										2	
						CO5	**CO.5** Providing knowledge about the development to modifiedbakeryproducts with special needs.			3			2									3	
Unit Operations in Food engineering		5	4	60	310	CO1	**CO.1** Understanding the concept of unit operation and various preliminary unit operations required for material handling.	3				1								3			
						CO2	**CO.2** Understanding the principles and working of equipments used in food industries.					3										3	
						CO3	**CO.3** Formulate and analyze the problems related to unit operations used in food engineering.		3														3
						CO4	**CO.4** Creating awareness regarding selection and application of tools and techniques used for the processing and storage of foods.					3						1				2	
						CO5	**CO.5** Applications of various processing methods in food industries			2											1	2	
Food Packaging	MFOT1-418	5	4	60	310	CO1	**CO.1** Imparting knowledge regarding importance of packaging in foods.	3												2			
						CO2	**CO.2** Understanding of various environmental concerns related to food packaging.						2	3								1	

						CO3	**CO.3** Creating awareness regarding novel methods of food packaging.			2							1					2	2
						CO4	**CO.4** Selection and application of appropriate packaging materials and techniques depending on the requirements of food products.					3										2	
						CO5	**CO.5** Understanding of different types of packaging materials used in food packaging	3					1					1		2			
Sugar and Confectionary Technology	MFOT1-418	5	4	60	400	CO1	**CO.1** Imparting the knowledge regarding manufacturing and deterioration of sugar.	3					2							3			
						CO2	**CO.2** Understanding of icings, toppings and confectionary.	2										1		2			
						CO3	**CO.3** Utilization of by-products of sugar industry.							3								2	
						CO4	**CO.4** Creating awareness regarding processing methods of cocoa and chocolate used in food industries.					2					1					2	
						CO5	**CO.5** Understanding various defects of chocolate.	2					1					1					2
Food Packaging Lab XII LAB-VI	MFOT1-418	5	2	30	004	CO1	**CO.1** Imparting knowledge about testing of physic-mechanical parameters of packaging materials.	3										2					2
						CO2	**CO.2** Understanding of principle and working of FFS machine.	2				3								2			
						CO3	**CO.3** Creating awareness about the recent advances in food packaging					3					2			2			
						CO4	**CO.4** Analyzing the effect of packaging on shelf life to food products in order to ensure food safety.						3					1				2	
						CO5	**CO.5** Quality assessment of packaged food products					2	2					1					2
Sugar and Confectio	MFOT1-418	5	2	30	004	CO1	**CO.1** Imparting knowledge about manufacturing of sugar and confectionary based products.	3														2	

						CO2	**CO.2** Students become aware about manufacturing of confectionary products.			2							1					2	
						CO3	**CO.3** Evaluation of various quality parameters of confectionary products.						3										2
						CO4	**CO.4** Understanding the mode of working in industrial setup as an individual and as a team.										3	1		2		
						CO5	**CO.5** Understanding of various types of packaging materials used for confectionary.	3													1		
Spices and Flavor Technology	MFOT1-418	5	4	60	400	CO1	**CO.1**Imparting knowledge classification, composition and uses of spices and flavors.	3					1							3			
						CO2	**CO.2**Understanding about processing techniques of spices.					3									2		
						CO3	**CO.3**Understanding of flavoring compounds, its classification and its application in food industries	3										2		2			
						CO4	**CO.4**Creating awareness about microbial contamination and insect infestation in spices and its control.						3				2	1					2
						CO5	**CO.5**Analyzing the role of flavorings and their stability during processing.		1				1					2					2
Spices and Flavor Technology Lab XIV ANIMAL PRODUCTS LAB VI	MFOT1-418	5	2	30	004	CO1	**CO.1**Imparting knowledge of proximate composition of spices.	3												3			
						CO2	**CO.2**Understanding of adulteration in spices.					1	3							1			1
						CO3	**CO.3**Evaluation of organoleptic properties of spices for their appropriate use in food products.					1						2				3	
						CO4	**CO.4** Analysis of microbiological quality of spices to ensure their safety for human consumption					1	3					1				3	
						CO5	**CO.5**Quality assessment of different spices.					2	1					1					2

Technology of Oils and Fats	MFOT1-418	5	4	60	400	CO1	**CO.1**Imparting knowledge of nutritional importance of fats and oils in human nutrition.	3					2							3			
						CO2	**CO.2**Understanding the extraction and processing techniques of fats and oils used at home and industrial scale.					3						1				2	
						CO3	**CO.3** Analyzing the physico-chemical properties of oils and fats for their suitability in food products					2						1				2	
						CO4	**CO.4**Creating awareness about factors affecting the storage of fats and oils from the safety point of view.						3				2	1				1	1
						CO5	**CO.5**Understanding of various modification methods of fats and oils to improve their physic-chemical properties.	3		2												1	
Technology of Oils and Fats Lab XV	MFOT1-418	5	2	30	004	CO1	**CO.1**Imparting knowledge about physic-chemical properties of fats and oils.	3												3			
						CO2	**CO.2**Understanding of adulteration in fats and oils.	3					2							1			1
						CO3	**CO.3** Evaluation of organoleptic properties of fats and oils for their appropriate use in food products.					3	2					1				2	
						CO4	**CO.4**Analysis of quality parameters of fats and oils to ensure their safety for human consumption.					2						2				2	2
						CO5	**CO.5**Understanding of various processing methods used at industrial scale.													1	1		
Food Engineering	MFOT1-418	6	4	60	310	CO1	**CO.1**Familiarize students with the basic concepts of food engineering including units and dimensions	3												3			
						CO2	**CO.2**Understanding the basic principles, processes and components of material and energy balances		2											2			
						CO3	**CO.3**Providing the knowledge about thermodynamic system and its different properties			1										2			
						CO4	**CO.4**Aware students about principles of fluid flow and its effect in food processing.						2									2	

						CO5	**CO.5**Interpretation of data using psychrometry and synthesis of information for developing appropriate storage and processing conditions.				3												2
Food and Nutrition	MFOT1-418	6	4	60	310	CO1	**CO.1**Understanding the concepts of relationship between food, nutrition and health.	3												2			
						CO2	**CO.2**Aware students about various nutrients, their classifications and functions associated with the human health.						2							1		1	
						CO3	**CO.3**Familiarize students with the concept of RDA and its importance in maintaining the health.			2										1		1	
						CO4	**CO.4**Imparting the knowledge of importance of meal planning in diet for different group of people.			2			2							1			1
						CO5	**CO.5**To create the awareness about FSSAI guidelines used for nutritional labelling in India.						2									2	
Sensory Evaluation of Food	MFOT1-418	6	4	60	400	CO1	**CO.1**Aware students about structure and functions of taste organs.	2												3			
						CO2	**CO.2**Providing the knowledge about taste measurements and taste abnormalities		2													1	
						CO3	**CO.3**Familiarize the students with the importance of odour, flavor and colour in sensory evaluation of food.						2							1			1
						CO4	**CO.4**Understanding the importance of texture and texture perception in food.				2												1
						CO5	**CO.5**Application of different types of equipment used for sensory evaluation of food.					3										2	
Sensory Evaluation of Food LAB-	MFOT1-418	6	2	30	004	CO1	CO.1 Creating awareness among students about the importance of sensory panel.	3												1			
						CO2	CO.2 Provide practical knowledge of various sensory tests.						2									1	
						CO3	CO.3 Conducting various tests for sensory evaluation of different food products.						2									1	1

						CO4	CO.4 Familiarize students with various quality tests for milk products, cereals and confectionary products.					2										1	1
						CO5	CO.5 Imparting the knowledge about qualitative tests for various oils and fats					2											2
FOOD PLANT LAYOUT	MFOT1-418	6	4	60	400	CO1	CO.1 Provide knowledge about concepts of designing and importance of a good layout.	1			2									1			
						CO2	CO.2 Imparting the knowledge about importance of plant site and location factors.		2														1
						CO3	CO.3 Familiarize the students about the selection of plant building material and equipment's.																1
						CO4	CO.4 Creating the awareness about layout symbols among students.													1			
FOOD PLANT LAYOUT LAB XVII	MFOT1-418	4	2	30	004	CO1	CO.1 Preparing the layouts for different processing plants.	3													1		
						CO2	CO.2 Familiarizing the students about process diagrams of various manufacturing units.					2									1		1
						CO3	CO.3 Imparting the knowledge about calculations related to processing cost.										2				1		
						CO4	CO.4 Creating the awareness among students about the processes to calculate the life of various machines and equipments in the plant.					2					2				1		1
						CO5	CO.5 Synthesize the information about the shelf life estimation of various machines.		2												1		1
FOOD SAFETY	MFOT1-418	6	4	60	400	CO1	CO.1 Aware students about food safety and importance of food safety.	3												3			
						CO2	CO.2 Understanding the concept of Hygiene and Sanitation in Food Service Establishments and their association with food safety.						2									2	

						CO3	CO.3 Familiarize the students about various food hazards and its impact on health.			1			2									1	1
						CO4	CO.4 Providing knowledge about food safety tools and their need for food quality.					3						2				1	1
							CO.5 Imparting the knowledge about different food safety laws.						2							1		1	
FOOD SAFETY LAB XVIII	MFOT1-418	6	2	30	004	CO1	CO.1 Performing various tests for preparation of selective and complex media.	1														1	
						CO2	CO.2 Creating the ability of handling tools for microbiological tests.					3										1	
						CO3	CO.3 Imparting the knowledge about different methods of staining and its use in food safety.						3					1				1	
						CO4	CO.4 Aware students about the importance of personal hygiene and its assessment.							2									2
						CO5	CO.5 Familiarize the students about detection of physical and chemical hazard in food.					2											2
Food Quality Management	MFOT1-418	6	4	60	400	CO1	CO.1 Aware students about quality concepts, quality perception, quality attributes of foods.	3												3			
						CO2	CO.2 Familiarize students to the concepts of quality management	3					2										1
						CO3	CO.3 Imparting the knowledge about food contamination, heavy metals, pesticide residues, antibiotics, agrochemicals, veterinary drug residues, environmental pollutants.							3									2
						CO4	CO.4 Understanding the need of food additives in food processing and preservation.			2										1		1	
						CO5	CO.5 Providing the knowledge of various freezing methods used in food industries.					1									1	1	
Food Quality	MFOT1-418	4	2	30	004	CO1	CO.1 Understanding the concept of qualitative analysis of various milk products.	3				1								1		1	

						CO2	CO.2 Familiarize students with quality inspection of cereals, pulses and spices.					2											2
						CO3	CO.3 Creating the ability to determine various contaminants in water.		3			1											2
						CO4	CO.4 Providing a platform for quality testing of various food products.					3										1	1
						CO5	CO.5 Imparting the knowledge about insecticides and heavy metals present in food.							2									3

Enter Correction levels 1, 2 or 3 as defined below:

1. Slight (Low) - upto 30% 2. Moderate (Medium) – above 30% and upto70% 3. Substantial (High) – above 70%