MAHARAJARANJITSINGHPUNJABTECHNICALUNIVERSITYBATHINDA-151001(PUNJAB),INDIA

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Department: **DEPARTMENTOFFOODSCIENCEANDTECHNOLOGY**

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

COURSE ARTICULATION MATRIX (STUDY SCHEME:2018)

Subject	SCode	Semester	Credit	Duration(Hrs)	LT P	COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
PRINCIPLES OF FOOD PRESERVATION	MFOT1-101	1	4	60	400	CO1	CO1 Imparting knowledge on the causes of food spoilage and principles of food preservation	3					2							3			
						CO2	**CO2**Understanding the applications of basic and advanced equipments used for food preservation					3										2	
						CO3	CO3 Creating the awareness about limits of chemical preservatives safe for human consumption.						3				2						3
						CO4	CO4 Analyzing the effectiveness of novel preservation techniques over traditional methods with respect to food and environment.			2				1							3		

BASIC FOOD MICROBIOLOGY	MFOT1-102	1	4	60	40 0	CO1	CO1Applying the knowledge of HACCP and food safety to prevent the growth of microbes in foods.	2					3							3			
						CO2	CO2 Detection of food borne pathogens using novel techniques of analysis					2	2									3	
						CO3	CO3 Evaluating the factors encouraging and restricting the growth of microbes in foods						2							3			
						CO4	CO4Analyzing the role of pathogens in food borne illnesses						2								3		
FOOD CHEMISTRY	MFOT1-103	1	4	60	40 0	CO1	CO1Imparting the knowledge of chemical composition of food.	3												3			
						CO2	CO2 Understanding the harmful effects of allergens and toxic constituents of foods on human health.						3								3		
						CO3	CO3 Analysing the factors affecting nutritional composition of food.		1				2									3	
						CO4	CO4 Evaluating the processes leading to desirable and undesirable changes occurring in food			3			2							2			
FOOD ANALYSIS AND	MFOT1-104	1	2	30	00 4	CO1	CO1 Understanding the nutritional composition of food	3					2							3			
						CO2	CO2Application of novel techniques in food analysis					3										3	
						CO3	CO3Evaluating the quality parameters of food products to ensure food safety and public health					1	3								3		
						CO4	CO4Analysis of proximate composition of food products					1	2									3	
FOOD MICROBIOLOG	MFOT1-105	1	2	30	00 4	CO1	CO1Imparting the knowledge of media preparation, staining methods and handling practices	3				1								3			
						CO2	CO2Application of microbial tools and techniques for detection of spoilage microorganisms					3	1									3	

						CO3	CO3 Analyzing the microbial load of different food products to determine their safety for human consumption.						3								3		
						CO4	CO4 Evaluating the growth curve of microbes in relation to its effect on food quality.		3		1									3			
NUTRACEUTICAL AND FUNCTIONAL FOODS	MFOT1-156	1	4	60	400	CO1	CO1Imparting the knowledge of nature, types, and scope of nutraceutical and functional foods.	3												3			
						CO2	CO2Application of nutraceutical and functional foods for the treatment of various disorders						3										3
						CO3	CO3 Creating the ability of effective communication with society regarding therapeutical effects of nutraceutical and functional foods.						2				3				2		
						CO4	CO4 Evaluating the functionality of nutraceutical compounds with respect to their stability and shelf life			1			1									2	
NUTRITION AND HEALTH	MFOT1-157	1	4	60	400	CO1	CO1Imparting knowledge about basic terminology of nutrition and different functions of food.	3					2							3			
						CO2	CO2Application and role of foods to address various health issues.	3															2
						CO3	CO3 Creating the awareness regarding social, cultural and physiological aspects of foods.						3				1			2			
						CO4	CO4 Analyzing the nutritional requirements for different age groups.		1				3								3		
BASIC FOOD ENGINEERING	MFOT1-206	2	4	60	400	CO1	CO1 Imparting the knowledge about fundamental concepts of food engineering	3												3			
						CO2	CO2 Understanding the principles of food engineering for efficient utilization of finance and project management in food industry		2									3		3			
						CO3	CO3 Analysis of problems related to commercial sterilization of food products		3				1								2		

						CO4	CO4 Interpretation of data using psychrometry and synthesis of information for developing appropriate storage and processing conditions				3								1				2	
TECHNOLOGY OF CEREALS AND MILLETS	MFOT1-207	2	4	60	400	CO1	CO1 Imparting the knowledge of structure and chemical composition of different cereal grains.	3					1							3				
						CO2	CO2 Application of techniques and machineries for the quality assessment of cereal grains and their products.					3											3	
						CO3	CO3Analyzing the role of ingredients in development of food products from different cereal grains.			3										3				
						CO4	CO4Understanding the utilization of by-products of milling and formulation of convenience foods for sustainable development.							3							2			
COMPUTER FUNDAMENTALS AND STATISTICS	MFOT1-208	2	4	60	400	CO1	CO1 Imparting the basic knowledge of computer, number system and computer networks.	3												3				
						CO2	CO2Application of software packages for making reports, documents and effective presentations.										3			3				
						CO3	CO3 Analysis and interpretation of data using statistical techniques.				3												2	
						CO4	CO4 Understanding the types and functions of different hardware and software devices for better project management	2										3		3				
TECHNOLOGY OF CEREALS AND MILLET SLAB –III	MFOT1-209	2	2	30	004	CO1	CO1Imparting knowledge of proximate composition of flours from different cereal grains.	3												3				
						CO2	CO2 Understanding the mode of working in industrial setup as an individual and as a team.										3			2				
						CO3	CO3Evaluation of different properties of cereal starches using modern techniques.				3												2	
						CO4	CO4Analysis of quality attributes of cereal grains so as to meet legal specifications.	2										3			2			
TECHNOLOGY	MFOT1-	2	4	60	400	CO1	CO1Imparting the knowledge of types and importance of beverages.	3					2							3				

						CO2	CO2 Understanding the technology behind processing of different beverages to meet the legal specifications.					2	2									2	
						CO3	CO3 Application of low calorie sweeteners for preparation of beverages to address the specified needs of consumers.			2			2											2
						CO4	CO4 Creating awareness to communicate regarding safety levels of additives used in beverage preparation along with quality standards of bottled water.						2				3				2			
TECHNOLOGY OF MALTING AND BREWING	MFOT1-259	2	4	60	400	CO1	CO1Imparting the basic knowledge of production, trade, structure and composition of barley.	3					2					1		3			
						CO2	CO2 Application of malt for development of different food products.			3												2	
						CO3	CO3 Quality evaluation of ingredients involved in production of beer.					2	1									2	
						CO4	CO4 Understanding the techniques involved in processing and quality assessment of beer.					3	1										2
FOOD BIOTECHNOLOGY	MFOT1-259	2	4	60	400	CO1	CO1 Imparting the knowledge of basic principles of genetic engineering with respect to food.	3															3
						CO2	CO2 Understanding the applications of bacteriocins in food systems along with the safety levels.						3							2			
						CO3	CO3Creating awareness of bioethics in food biotechnology.								3		1				1		
						CO4	CO4 Application of novel processes and techniques for improvement in various foods.			3			1									2	
FOOD ADDITIVES	MFOT1-260	2	4	60	400	CO1	CO1 Imparting knowledge of types and functions of different food additives.	3					2							3			
						CO2	CO2 Understanding the limitations of application of food additives in food products.					1	2							2			
						CO3	CO3 Creating awareness regarding use of food additives and their permissible limits.						3				1				2		

						CO4	CO4 Applications of recent advances in additives in context to different food attributes.			2		1											2	
TECHNOLOGY OF FRUITS AND VEGETABLES	MFOT1-310	3	4	60	400	CO1	CO1 Imparting knowledge about classification and nutritional value of fruits and vegetable.	3					2							3			
						CO2	CO2 Application of appropriate techniques and modern machineries for the production of quality products from fruits and vegetable.					3	2									2	
						CO3	CO3Creating awareness about spoilage in fruits and vegetables to avoid the occurrence of food borne illnesses.						3				2				3		
						CO4	CO4 Development and utilization of byproducts from fruits and vegetables waste to address the environmental concerns.			1				3							3		
UNIT OPERATIONS IN FOOD ENGINEERING	MFOT1-	3	4	60	400	CO1	CO1Imparting knowledge of preliminary unit operations.	3												3			
						CO2	CO2Understanding the principles of food engineering and apply these to manage the projects in industrial setups.											2			2		
						CO3	CO3 Creating awareness regarding selection and application of tools and techniques used for the production and storage of foods.					3					1			2			
						CO4	CO4Formulate and analyze the complex problems of unit operations used in food engineering		3		1											1	
TECHNOLOGY OF FRUITS AND VEGETABLES LAB–IV	MFOT1-313	3	2	30	004	CO1	CO1 Imparting knowledge regarding extraction of juices and preparation of products from fruits and vegetables.	3					2							3			
						CO2	CO2 Creating awareness about quality assessment of products for production of quality food.						3				1					2	
						CO3	CO3 Analyzing the microbiological parameters of the products to meet the safety standards.						3								3		
						CO4	CO4 Evaluating the cost of food products for better management of finance in one's own work and industrial set ups.											3		1			
FOOD PACKAGIN	MFOT1-	3	2	30	004	CO1	CO1 Identification of different packaging materials as per the requirements of food products using principles of food additives	3												3			

						CO2	CO2 Understanding the application of novel food packaging techniques.						3									2	
						CO3	CO3Evaluating the quality of packaged food products so as to provide safe food for consumption.			2							1				3		
						CO4	CO4 Analyzing the physical parameters of packaging materials to meet the legal specifications.					3								2			
FOOD STANDARDS AND QUALITY	MFOT1-362	3	3	45	300	CO1	CO1Imparting knowledge of concepts of food quality and assurance.	3					2							3			
						CO2	CO2 Understanding the laws and regulation in relations to food quality and safety.						3							3			
						CO3	CO3 Applications of good hygiene and good laboratory practices with respect to environmental considerations.							3			1				3		
						CO4	CO4 Creating awareness about various sampling techniques and analysis of data using statistical quality control		3								1					1	
TECHNOLOGY OF PULESES AND OILSEEDS	MFOT1-363	3	3	45	300	CO1	CO1 Imparting knowledge about importance of fats and oils in human nutrition.	3					2							3			
						CO2	CO2 Understanding the importance of oilseed processing and applying these to one's own work and in industrial setups.											3		3			
						CO3	CO3Creating awareness about selection and application of techniques and machineries in milling and extraction processes.					3					1					2	
						CO4	CO4 Demonstrating knowledge about anti-nutritional factors and their modes of elimination so as to ensure public health.	3					3								3		
FOOD PACKAGING LAB - V	MFOT1-314	3	2	30		CO1	CO1 Identification of different packaging materials as per the requirements of food products using principles of food packaging	3												3			
						CO2	CO2 Understanding the application of novel food packaging techniques					3								3			
						CO3	CO3 Evaluating the quality of packaged food products so as to provide safe food for consumption					2	3										2

					CO4	CO4 Analyzing the physical parameters of packaging materials to meet the legal specifications						2								3		
TECHNOLOGY OF EGG, MEAT, FISH AND MFOT1-415	4	4	60	400	CO1	CO1 Imparting knowledge about composition and nutritional value of meat, fish and poultry.	3					2							3			
					CO2	CO2Applying ethical principles in various practices involved in slaughtering of animals.					1			3								2
					CO3	CO3Evaluation of internal and external quality parameters of egg to ensure safety for consumption.					2									3		

						CO4	CO4 Creating awareness regarding utilization of by products from meat industry in context to environment.	1						3							3		
TECHNOLOGY OF MILK AND MILK PRODUCTS	MFOT1-416	4	4	60	400	CO1	CO1 Imparting knowledge about composition, nutritive value and processing of milk and milk products.	3					2							3			
						CO2	CO2 Understanding the microbiological quality of fresh milk to ensure its safety for human consumption and processing.						3								3		
						CO3	CO3 Cost effective utilization of by-products of dairy industry to address the environmental concerns.							2				3			2		
						CO4	CO4Creating awareness about scope, strengths and opportunities of dairy industry and its implementation to become entrepreneur.										2	3					1
FOOD ANALYSIS AND INSTRUMENTATION	MFOT1-417	4	3	45	300	CO1	CO1 Imparting knowledge about proximate analysis of food products.	3				1								3			
						CO2	CO2 Understanding the selection and application of appropriate modern techniques for quality assessment of foods.					3										2	
						CO3	CO3 Creating awareness regarding sampling techniques, statistical analysis and interpretation of data along with expression of results.		3		3						1			2			
						CO4	CO4Application of novel methodologies for microbial load analysis of food to ensure safety for consumption					3	2								2		
TECHNOLOGY OF ANIMAL PRODUCTS LAB-VI	MFOT1-418	4	2	30	004	CO1	CO1Imparting knowledge development of various processed foods from animal products.	3		2										3			
						CO2	CO2 Understanding the mode of working in industrial setup as an individual and as a team.									3				2			
						CO3	CO3 Evaluation of microbiological quality of milk and milk products to ensure their safety for consumption.					3	2								3		
						CO4	CO4 Analysis of quality parameters of animal products so as to meet the legal specifications					3	2									3	

EnterCorrectionlevels1,2or3asdefinedbelow:

1.Slight(Low)- upto30% 2. Moderate (Medium)–above30%andupto70% 3. Substantial (High)– above70%