



## 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	2													2								
						CO2	CO2 Remembering the general characteristics of micro-organisms in relation to their effect on plant and human health.					2													3				
						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																3
						CO5	CO5 Creating the ability to communicate with food science community and society about the merits and demerits of micro-organisms.													3							3		



						CO4	CO.4 Providing knowledge about collection, storage and analysis of data with minimum human errors.								3			2			
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					C02	<b>CO.2</b> Creating an ability to communicate effectively with food science community and the society with effective report writing and presentations.												3					3							
					C03	<b>CO.3</b> Engaging students in team work by organizing group discussions on different topics.						3						1												
					C04	<b>CO.4</b> Increasing the probability of employment in a reputed industry or organization by improving the interview skills.												2							2					
					C05	<b>CO.5</b> Creating an ability to identify problems and solutions by improving the listening skills of the students.												3							2					
<b>INTRODUCTION TO FOOD TECHNOLOGY II</b>	BFOTS1-201	2	4	60	31 0	C01	<b>CO.1</b> Identifying the problems arise during storage of fruits and vegetables and resolve them by basic and advanced tools.		3																3					
						C02	<b>CO.2</b> Understanding the compositional and nutritional properties of fruits and vegetables that results in the production of value-added food products.		2																			3		
						C03	<b>CO.3</b> Applying ethical principles during the handling of animals before processing and preservation of animal products.								3															2
						C04	<b>CO.4</b> Creating the knowledge about overview of general processing methods of Indian spices and their therapeutic uses.							3									3							
						C05	<b>CO.5</b> Imparting the knowledge regarding usages of appropriate techniques for the quality evaluation of various food products.							3																3
<b>PRINCIPLES OF FOOD PRESERVATION</b>	BFOTS1-202	2	4	60	31 0	C01	<b>CO.1</b> Imparting the knowledge regarding various methods of preservation of food and their effect on physiochemical properties of food.	3														3								
						C02	<b>CO.2</b> Selecting appropriate equipment's for preservation of different food products with an objective of minimal degradation of nutrients.							3															3	
						C03	<b>CO.3</b> Synthesize information for freezing and drying of different food products with the use of freezing and drying curves.					3														3				















TECHNOLOGY OF CEREALS, PULSES AND OILSEEDS	BFOTS1-401	4	4	60	310	CO5	CO.5 Imparting moral values to the students that aids in the development of an individual and society.													2								
						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.	2				1															3	
						CO3	CO.3 Remembering the concept of conversion of cereal grain in value added product and their application related with human health.	1			1		2													2		
						CO4	CO.4 Imparting basic knowledge of physiochemical properties of different cereals and their effect on processing of food.				3			3												3		
EGG, POULTRY AND MEAT TECHNOLOGY	BFOTS1-402	4	4	60	310	CO1	CO.1 Providing the knowledge of structure and composition of different meat and meat products.	3			1										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.				2				3													2
						CO5	CO.5 Creating awareness regarding by product utilization of meat industry									2			2							2		
FOOD PLANT HYGIENE AND	BFOTS1-403	4	4	60	310	CO1	CO.1 Understanding the concept and importance of personal hygiene and its role in food safety.						2								3							
						CO2	CO.2 Familiarizing the students with different types of byproduct utilization and their application in various fields.	3																	2			















TECHNOLOGY OF OILS AND FATS	BFOTD1-513	5	4	60	400	C01	CO.1Imparting knowledge of nutritional importance of fats and oils in human nutrition.	3									3				
						C02	CO.2Understanding the extraction andprocessing techniques of fats and oils used at home and industrial scale.		2					1		3					
						C03	CO.3 Analyzing the physico-chemical properties of oils and fats for their suitability in food products		2						1			3			
						C04	CO.4Creating awareness about factors affecting the storage of fats and oils from the safety point of view.				3									2	
						C05	CO.5Understanding of various modification methods of fats and oils toimprove their physic-chemical properties.					2		2			2				
TECHNOLOGY OF OILS AND FATS LAB XV	BFOTD1-514	5	2	30	004	C01	CO.1Imparting knowledge about physic-chemical properties of fats and oils.	3									3				
						C02	CO.2Understanding of adulteration in fats and oils.	3			2					2					
						C03	CO.3 Evaluation of organoleptic properties of fats and oils for theirappropriate use in food products.			2		1							2		
						C04	CO.4Analysis of quality parameters of fats and oils to ensure their safety for human consumption.		3		2								3		
						C05	CO.5Understanding of various processing methods used at industrialscale.					2		2							1
FOOD ENGINEERING	BFOTS1-601	6	4	60	310	C01	CO.1Familiarize students with the basic concepts of food engineering including units and dimensions	3									3				
						C02	CO.2Understanding the basic principles, processes and components of material and energy balances				2					3					
						C03	CO.3Providing the knowledge about thermodynamic system and its different properties	2			1					3					
						C04	CO.4Aware students about principles of fluid flow and its effect in food processing.								2		1				







						CO2 Familiarize students with quality inspection of cereals, pulses and spices.				2										3					
						CO3 Creating the ability to determine various contaminants in water.	2		1									1							
						CO4 Providing a platform for quality testing of various food products.				3									3						
						CO5 Imparting the knowledge about insecticides and heavy metals present in food.		3									3								
FOOD STORAGE ENGINEERING	BFOTS1-701	7	4	60	400	CO1. Familiarize students with the importance of scientific storage systems	3										3								
						CO2. Understanding various post-harvest changes and causes of spoilage in fruits and grains					2											2			
						CO3. Providing knowledge about various storage structures	3														3				
						CO4. Creating awareness amongst students about prevention of fruits and grains from insects and pests									2			3				2			
						CO5. Understanding the design of storage structures and various specifications for designs of storage systems									3										2
FOOD BIOTECHNOLOGY	BFOTS1-702	7	4	60	400	CO1. Imparting knowledge about basics of food biotechnology	3										3								
						CO2. Creating the awareness about different toxins and various natural antimicrobial agents used in food preservation					2			2									2		
						CO3. Remembering the concept of genetic engineering and its role in food production enhancement	3														3				
						CO4. Understanding the methods and applications of protein engineering in food technology								2										2	
						CO5. Analyzing the role of Intellectual property rights (IPR) in biotechnology and their associated benefits									1				2	1					2

TECHNOLOGY OF BEVERAGES	BFOTS1-703	7	4	60	400	C01	CO1. Imparting the knowledge of types and importance of beverages	3										3							
						C02	CO2. Understanding the technology behind processing of different beverages to meet the legal specifications			3			2										3		
						C03	CO3. Familiarize with the concept of water treatment along with quality parameters involved	3					1												2
						C04	CO4. Application of different types of additives to address the specified needs of consumers				1			2											3
						C05	CO5. Creating awareness regarding quality control tests used in beverages										3								3
SNACKS AND EXTRUSION TECHNOLOGY	BFOTS1-704	7	4	60	400	C01	CO1. Imparting knowledge about compositions, formulations and quality testing of Snack foods	3										3							
						C02	CO2. Creating awareness aware about specifications, composition, ingredients, processing techniques of breakfast cereals and texturized vegetable protein					2			3								3		
						C03	CO3. Familiarizing with different types of extruders	3															3		
						C04	CO4. Understanding manufacturing of different extruded products				3														2
						C05	CO5. Analyzing the chemical and nutritional changes in food during extrusion		2																2
TECHNOLOGY OF BEVERAGES LAB	BFOTS1-705	7	4	60	004	C01	CO1. Imparting knowledge regarding quality analysis of water	3													2				
						C02	CO2. Understanding the technology behind processing of different types of beverages			2												3			
						C03	CO3. Familiarize with the methods involved in determination of different additives used in the formulation of beverages	3		2													3		
						C04	CO4. Analysis of quality parameters of beverages so as to meet the legal specifications						3												3
						C05	CO5. Understanding the mode of working in industrial setups as an individual and as a team										3		2					3	



SNACKS AND EXTRUSION LAB	BFOTS1-706	7	2	60	004	CO1	CO1. Understanding of identifications and composition of various ingredients used for manufacturing of snacks and extruded products	3										3								
						CO2	CO2. Imparting knowledge about testing of different raw materials used in preparation of snacks and extruded products				1	1													2	
						CO3	CO3. Development of different snack food products and extruded products			3															3	
						CO4	CO4. Familiarizing with different tests to quality evaluation of extruded products		3			2														3
						CO5	CO5. Creating awareness about packaging of snack food products and extruded products							2				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%