

# GANPAT UNIVERSITY

## FACULTY OF SCIENCE

### TEACHING AND EXAMINATION SCHEME

Program		B.Sc. – Food Technology	Branch	Food Technology	Semester	II	Version	1.0.0.0									
Effective from		2018-19	Effective for batches admitted onwards		2018-19												
S. N	Subject Code	Subject Name	Theory / Practical	Teaching Scheme								Examination Scheme					
				Credit				Hours Per Week				Theory Marks		Practical Marks			Total Marks
				Th	Tu	Pr	Total	Th	Tu	Pr	Total	Internal	ES	CE	SE	ES	
1	BFT201	Food and Nutrition	Theory / Practical	3	1	2	6	3	1	4	8	40	60	40	60	200	
2	BFT202	Chemistry of Food	Theory / Practical	3	1	2	6	3	1	4	8	40	60	40	60	200	
3	BFT203	Food Microbiology	Theory / Practical	3	1	2	6	3	1	4	8	40	60	40	60	200	
4	BFT204	Communications Skill	Theory	3	-	-	3	3	-	-	3	40	60	-	-	100	
		Total		12	3	6	21	12	3	12	27	160	240	120	180	700	

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FACULTY OF SCIENCE												
Program	B.Sc. – Food Technology			Branch/Spec.	Food Technology							
Semester	II			Version	1.0.0.0							
Effective from Academic Year	2018-19			Effective for the batches Admitted onwards	June 2018							
Subject code	BFT201			Subject Name	Food and Nutrition							
Teaching scheme				Examination scheme								
	Th	Tu	Pr	Total	Marks	CE	SE	ES	Total	Duration	SE	ES
Hours	3	1	4	8	Theory	20	20	60	100	Theory	1 hr.	3 hr.
Credit	3	1	2	6	Practical	20	20	60	100	Practical	4 hr.	4 hr.
<b>Pre-requisites</b>												
Nil												
<b>Scope and Objectives:</b>												
1	To develop the basic knowledge in the area of human nutrition.											
2	To appreciate the relationship between food, nutrients function and contribution of nutrients to health of individuals.											
3	To make best use of available nutrients in order to full fill the requirements of balanced diet for the consumers.											
4	To familiarize the students about the nutritional daily requirements of various age groups as per ICMR,FA.											
<b>Learning Outcome:</b>												
Impart basic knowledge about the food and nutrition and remember the various terms relative to food and nutrition												
Understand the Classification, metabolism, Clinical manifestations of deficiency and excess of various nutrients												
Identify the Laboratory and anthropometry assessment and its importance												
Developed the skill for meal and diet planning for various age or income groups population												
Solve nutritional requirement calculations and evaluate nutrient incompatibilities related to nutrient deficiency of products												
Prepare different types of nutrient rich products at small scale with suitable labeling and packaging												
<b>Syllabus- Theory</b>												
Unit	Content											Hrs
1	<b>Introduction</b> Scope, concepts and importance of nutrition; definition of various terms used in food and nutrition, Understanding relationship between food, nutrients and health.											2
	<b>Balanced Diet</b> Functions of food-physiological, psychological and social, Concept of Balanced Diet, Malnutrition – over and under. Basic Food Groups, Food Pyramid.											2
	<b>Concepts of Meal Planning</b> Factors affecting meal planning, understanding specific considerations for planning meal for different groups of people.											2
	<b>Methods of Cooking</b> Dry, moist, frying and microwave cooking, Advantages, disadvantages and the effect of various methods of cooking on foods, Changes in food during cooking using dry heat, moist heat, heated oil and microwave.											4
2	<b>Carbohydrates</b> Classification, digestion, functions, dietary sources, requirement, Clinical manifestations of deficiency and excess and factors affecting absorption of carbohydrates.											5
	<b>Proteins</b> Classification, digestion, functions, dietary sources, requirement, evaluation of protein quality, Clinical manifestations of deficiency and excess and factors affecting absorption of proteins.											6
	<b>Lipids</b> Classification, digestion, functions, dietary sources, requirement, essential fatty acids, PUFA, Cholesterol, Clinical manifestations of deficiency and excess and factors affecting absorption of Lipids.											6
3	<b>Vitamins</b> Classification, digestion, functions, dietary sources, requirement, effects of deficiency.											4
	<b>Minerals</b> Classification, digestion, functions, dietary sources, requirement, effects of deficiency (Iodine, Sodium and Potassium etc.)											5
	<b>Dietary assessment as a part of Nutritional status</b>											4

	Types of Dietary assessment, Methods of diet survey, Analysis and interpretation, problems in diet survey and solutions.	
4	<b>Laboratory and Anthropometry</b> Qualitative and quantitative test, anthropometry assessment and its importance.	3
	<b>Nutritional Labeling</b> Importance, global trends, codex guidelines, nutritional labeling in India, FSSAI guidelines.	2
<b>Syllabus-Practical</b>		
1	Identification of food sources for various nutrients using food composition tables.	
2	Record diet of self using 24 hour dietary recall and its nutritional analysis.	
3	Introduction to meal planning, concept of food exchange system.	
4	Planning of meals for adults of different activity levels for various income groups.	
5	Planning of nutritious snacks for different age and income groups.	
6	Preparation of nutritious snacks using various methods of cooking.	
7	Nutritional labeling of food products.	
8	Estimation of BMI and other nutritional status parameters.	
9	Planning a diet using "Food Composition Tables" (ICMR).	
10	Standardization of low calorie food.	
11	Diet planning using "Food Exchange" method.	
12	Standardization of protein rich food.	
13	Colorimetric analysis of carbohydrates(Anthrone test).	
14	Estimation of total nitrogen in food.	
15	Estimation of calcium, phosphorous, iron and ascorbic acid in food.	
<b>Text books</b>		
1	Bamji MS, Krishnaswamy K, Brahmam GNV. Textbook of Human Nutrition, 3rd Edition. Oxford and IBH Publishing Co. Pvt. Ltd. 2009 .	
2	Srilakshmi. Food Science, 4th Edition. New Age International Ltd, 2007.	
3	Wardlaw MG, Paul M Insel Mosby. Perspectives in Nutrition, 3rd Edition, 1996	
4	Codex Guidelines on Nutrition Labeling (CAC/GL 2_1985) (Rev.1_1993). Rome, Food and Agriculture Organisation of the United Nations / World Health Organisation, 1993.	
5	Food Safety and Standards Authority of India portal, Government of India.	
6	Gopalan, C. NIN, ICMR. Nutritive Value of Indian Foods. 1990.	
7	Seth V, Singh K. Diet planning through the Life Cycle: Part 1. Normal Nutrition. A Practical Manual, Fourth edition, Elite Publishing House Pvt Ltd. 2005	
8	Gibney et al (ed.), Introduction to Human Nutrition, Blackwell Publishers, 2005 .	
9	Khanna K, Gupta S, Seth R, Mahna R, Rekhi T. The Art and Science of Cooking: A Practical Manual, Revised Edition. Elite Publishing House Pvt Ltd., 2004	
10	ICMR. Nutrient Requirements and Recommended Dietary Allowances for Indians, 2010.	

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Program	B.Sc. – Food Technology				Branch/Spec.	Food Technology						
Semester	II				Version	1.0.0.0						
Effective from Academic Year				2018-19	Effective for the batches Admitted onwards						June 2018	
Subject code	BFT202			Subject Name	Chemistry of food							
Teaching scheme					Examination scheme							
	Th	Tu	Pr	Total	Marks	CE	SE	ES	Total	Duration	SE	ES
Hours	3	1	4	8	Theory	20	20	60	100	Theory	1 hr.	3 hr.
Credit	3	1	2	6	Practical	20	20	60	100	Practical	4 hr.	4 hr.
<b>Pre-requisites</b>												
Nil												
<b>Scope and Objectives:</b>												
Upon completion of this course the student should be able to												
Acquaint the students about chemistry of various foods.												
<b>Learning Outcome:</b>												
Know the chemistry of food with respect to their functional activity.												
Understand the composition, structure of food and classified the food on the basis of their nutrition composition												
Apply understanding of food chemistry in food processing industry												
Analyze various physiochemical parameters in various natural and processed food												
Develop a attitude to design novel food product												
Creat skills to co-relate between chemistry of biomolecules and their effects on food quality.												
<b>Syllabus- Theory</b>												
Unit	Content											Hrs
1	<b>Introduction</b> Definition, Composition of food, Definition of water in food, Structure of water and ice, Types of water, Sorption phenomenon, Water activity and packaging, Water activity and shelf-life.											4
	<b>Lipids</b> Classification of lipids, Physical and chemical characteristics, Chemical deterioration of fats and oils (auto oxidation, rancidity, lipolysis, flavor reversion).											4
	<b>Proteins</b> Protein classification and structure, Nature of food proteins (plant and animal proteins, Properties of proteins, Functional properties of proteins.											3
2	<b>Carbohydrates</b> Classification, Structure and Chemical reactions of carbohydrates.											4
	<b>Vitamins</b> Types (Water soluble vitamins and Fat soluble vitamins).											3
	<b>Minerals</b> Major and minor minerals, Metal uptake in canned foods, Toxic metals.											4
3	<b>Enzymes</b> Introduction, classification, General characteristics, Important enzymes in food processing.											4
	<b>Browning Reactions in Food</b> Types, Enzymatic and Non enzymatic Browning and their control measures.											4
	<b>Changes occurring during food processing treatments</b> Drying and dehydration, Irradiation, Freezing, Canning.											4
4	<b>Natural Food Pigments</b> Introduction and classification, Food pigments (chlorophyll, carotenoids, anthocyanin's and flavonoids, beet pigments, caramel) .											4
	<b>Flavour</b> Definition and basic tastes, Description of food flavours, Flavour enhancers.											3

	<b>New product development</b> Definition, Importance, Need of product development, Steps of product development- Product development tools Reasons for failure.	4
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### Syllabus Practical

1	Determination of boiling point and freezing point of water.
2	Estimation of sugars.
3	Stages of sugar cookery.
4	Estimation of gluten content.
5	Estimation of polyphenols.
6	Determination of acidity.
7	Determination of natural pigments in foods.
8	Determination of gelatinization.
9	Fat acidity in foods-flour.
10	Determination of refractive index of fats.
11	Determination of carotenoids w.r.t flour pigments.
12	Estimation of total ash.
13	Estimation of minerals -demo
14	Determination of thermal inactivation time of enzymes in fruits and vegetables.
15	Introduction of the concept of new product development.

### Text books

1	Atlas, R.M. (1998) Microbiology: Fundamental and applications. 2nd edition, Macmillan Publishing Company, New York.
2	Pelezar, M.J., Chan, E.G.S. and Krieg, N.R. (1998) Microbiology
3	Heritage, J., Evance, E.G.V. and Killington, R.A. (1999) Microbiology inaction. Cambridge University Press.
4	Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004.
5	Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997.

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Semester	II				Version	1.0.0.0						
Effective from Academic Year	2018-19			Effective for the batches Admitted onwards	June 2018							
Subject code	BFT203			Subject Name	Food Microbiology							
Teaching scheme					Examination scheme							
	Th	Tu	Pr	Total	Marks	CE	SE	ES	Total	Duration	SE	ES
Hours	3	1	4	8	Theory	20	20	60	100	Theory	1 hr.	3 hr.
Credit	3	1	2	6	Practical	20	20	60	100	Practical	4 hr.	4 hr.
<b>Pre-requisites</b>												
Nil												
<b>Scope and Objectives:</b>												
<ul style="list-style-type: none"> <li>To understand the role and significance of microbes of different categories, microbial inactivation and environmental factors that affect them in foods.</li> </ul>												
<b>Learning Outcome:</b>												
Know various aspects of food microbiology and food fermentation												
Understand different categories of microorganisms, food spoilage, sterilization and disinfection process, etc. used in food industries.												
Apply microbiological testing tools in evaluation of food products.												
Analyse and interpret microbiological standardization of food												
Evaluate presence of microorganisms in fresh, preserve and processed food												
Perform testing of various food products for quality analysis and shelf life study												
<b>Syllabus- Theory</b>												
Unit	Content											Hrs
1	<b>Introduction to Food Microbiology</b> History and Development of Food Microbiology, Definition and Scope of food microbiology, Inter-relationship of microbiology with other sciences.											4
	<b>Characteristics of Microorganisms in Food</b> Types of microorganisms associated with food, their morphology and structure, Significance of spores in food microbiology.											5
	<b>Microbial Growth in Food</b> Bacterial growth curve and microbial growth in food, Factors affecting the growth of micro organisms in food.											4
	<b>Microbial Food Spoilage</b> Sources of Microorganisms in foods, Some important food spoilage microorganisms, Spoilage of specific food groups- Milk and dairy products, Meat ,poultry and seafoods, Cereal and cereal products, Fruits and vegetables and Canned products.											8
2	<b>Foodborne Disease</b> Types – foodborne infections, foodborne intoxications and toxic infections.											4
	<b>Control of Microorganisms in Foods</b> Principles and methods of preservation, Physical Methods of Food Preservation- Dehydration, Freezing, Cool Storage, Heat Treatment (esp. thermobacteriology), Irradiation, Biopreservatives esp. Bacteriocins, Introduction to Hurdle concept and Non Thermal methods.											8
3	<b>Food Fermentations</b> Fermentation –definition and types, Microorganisms used in food fermentations, Dairy Fermentations-starter cultures and their types , concept of probiotics, Fermented Foods types, methods of manufacture for vinegar, sauerkraut, tempeh, miso , soya sauce ,beer, wine and traditional Indian foods.											8
	<b>Trends in Food Microbiology</b> Rapid Methods of Detection, Recent Advances.											4
<b>Syllabus-Practical</b>												
1	Introduction to the Basic Microbiology Laboratory Practices and Equipment.											
2	Functioning and use of compound microscope.											
3	Estimation of bacterial population in a given of food sample by Direct Microscopic Count(DMC) method.											
4	Isolation of pure culture of bacteria by Pour Plate and Streak Plate method.											
5	Estimation of bacterial load of food sample by SPC (Standard Plate Count) method.											
6	To study simple staining of bacteria.											
7	To conduct Gram’s staining of bacteria and differentiate between Gram +ve and Gram –ve bacteria.											
8	Determination of bacteriological quality of portable water and soft drink by SPC method.											

9	Microbial analysis of cereals and cereal products such as wheat flour and biscuit.
10	Microbial analysis of spices (Red chilies and coarinder).
11	Detection of presence of E. Coli and Coliform bacteria by rapid high coliform test.
12	Detection of presence of coliforms in water by MPN method.
13	Studies on bacterial growth curve.
14	Estimation of total microbial count of: surrounding air, workers and fruits and vegetables.
15	To study various sub culturing techniques.
<b>Text books</b>	
1	Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004.
2	Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000 .
3	Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997.
4	Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993.

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Program	B.Sc. – Food Technology				Branch/Spec.			Food Technology				
Semester	II				Version			1.0.0.0				
Effective from Academic Year		2018-19		Effective for the batches Admitted onwards				June 2018				
Subject code	BFT204			Subject Name		Communication skill						
Teaching scheme					Examination scheme							
	Th	Tu	Pr	Total	Marks	CE	SE	ES	Total	Duration	SE	ES
Hours	3	-	-	3	Theory	20	20	60	100	Theory	1 hr.	3 hr.
Credit	3	-	-	3	Practical	-	-	-	-	Practical	-	-
<b>Pre-requisites</b>												
Nil												
<b>Scope and Objectives:</b>												
<ul style="list-style-type: none"> <li>It aims at imparting the communication skills that are needed in their academic and professional pursuits.</li> </ul>												
<b>Learning Outcome:</b>												
Understand the importance of communication skills, barriers and perspectives in communication as a food technologist												
To know that how to do effective written communication and write effectively												
Express the major elements of communication and various communication styles												
Make effective presentation, face job interview and participate in group communication fruitfully.												
Enhance the confidence level of students and enable them to communicate in real life												
Develop leadership qualities and team spirit.												
<b>Syllabus- Theory</b>												
Unit	Content											Hrs
1	<b>Communication Skills:</b> Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context <b>Barriers to communication:</b> Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers <b>Perspectives in Communication:</b> Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment											12
2	<b>Elements of Communication:</b> Introduction, Face to Face Communication - Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication <b>Communication Styles:</b> Introduction, The Communication Styles Matrix with example for each - Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style.											12
3	<b>Basic Listening Skills:</b> Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations. <b>Effective Written Communication:</b> Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion' Required, Shades of Meaning, Formal Communication . <b>Writing Effectively:</b> Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message.											12
4	<b>Interview Skills:</b> Purpose of an interview, Do's and Dont's of an interview. <b>Giving Presentations:</b> Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery.											5
5	Group Discussion: Introduction, Communication skills in group discussion, Do's and Dont's of group discussion.											4
<b>Text books</b>												
1	Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011.											
2	Communication skills, Sanjay Kumar, Pushpalata, 1stEdition, Oxford Press, 2011.											
3	Organizational Behaviour, Stephen .P. Robbins, 1stEdition, Pearson, 2013.											
4	The Ace of Soft Skills: Attitude, Communication and Etiquette for success, GopalaSwamy Ramesh, 5thEdition, Pearson, 2013.											
5	Brilliant- Communication skills, Gill Hasson, 1stEdition, Pearson Life, 2011.											
6	Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Green hall, 1st Edition Universe of Learning LTD, 2010.											
7	Communication skills for professionals, Konarnira, 2ndEdition, New arrivals – PHI, 2011.											
8	Personality development and soft skills, Barun K Mitra, 1stEdition, Oxford Press, 2011.											



9	Soft skill for everyone, Butter Field, 1st Edition, Cengage Learning indiapvt.ltd, 2011.
10	Soft skills and professional communication, Francis Peters SJ, 1stEdition, McGraw Hill Education, 2011.
11	Effective communication, John Adair, 4thEdition, Pan Mac Millan,2009.
12	Bringing out the best in people, Aubrey Daniels, 2ndEdition, McGraw Hill, 1999.