GANPAT UNIVERSITY

FACULTY OF SCIENCE

TEACHING AND EXAMINATION SCHEME

Program	B.Sc. – Food Technology	Branch	Food Technology	Semester	2	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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Program	B.Sc. – Food Technology	Branch/Spec.	Food Technology
Semester	2	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.

Pre-requisites

Nil

Scope and Objectives:

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.

Learning Outcome:

After completion of this course, student will be able to:

- Comprehend various aspects of food nutritional requirements and concept of balance diet.
- Understand the physiological and metabolic functions of nutrients.
- Understand the health benefits of foods.
- Apprehend the nutritional daily requirements of various age groups as per ICMR

Syllabus- Theory

Unit	Content	Hrs
1	**Introduction** Scope, concepts and importance of nutrition; definition of various terms used in food and nutrition, Understanding relationship between food, nutrients and health.	2
	Balanced Diet Functions of food-physiological, psychological and social, Concept of Balanced Diet, Malnutrition – over and under. Basic Food Groups, Food Pyramid.	2
	Concepts of Meal Planning Factors affecting meal planning, understanding specific considerations for planning meal for different groups of people.	2
	Methods of Cooking 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	**Carbohydrates** Classification, digestion, functions, dietary sources, requirement, Clinical manifestations of deficiency and excess and factors affecting absorption of carbohydrates.	5
	Proteins Classification, digestion, functions, dietary sources, requirement, evaluation of protein quality, Clinical manifestations of deficiency and excess and factors affecting absorption of proteins.	6
	Lipids 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	**Vitamins** Classification, digestion, functions, dietary sources, requirement, effects of deficiency.	4
	Minerals Classification, digestion, functions, dietary sources, requirement, effects of deficiency (Iodine, Sodium and Potassium etc.)	5
	Dietary assessment as a part of Nutritional status Types of Dietary assessment, Methods of diet survey, Analysis and interpretation, problems in diet survey and solutions.	4

4	**Laboratory and Anthropometry** Qualitative and quantitative test, anthropometry assessment and its importance.	3
	Nutritional Labeling Importance, global trends, codex guidelines, nutritional labeling in India, FSSAI guidelines.	2
Syllabus-Practical		
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	Preperation 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.	
Text books		
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	2				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.

Pre-requisites

Nil

Scope and Objectives:

Upon completion of this course the student should be able to

- Acquaint the students about chemistry of various foods.

Learning Outcome:

- After studying this course, the students shall be aware of the underlying chemistry, properties and effects of processing on food components.

Syllabus- Theory

Unit	Content	Hrs
1	**Introduction** 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
	Lipids Classification of lipids, Physical and chemical characteristics, Chemical deterioration of fats and oils (auto oxidation, rancidity, lipolysis, flavor reversion).	4
	Proteins Protein classification and structure, Nature of food proteins (plant and animal proteins, Properties of proteins, Functional properties of proteins.	3
2	**Carbohydrates** Classification, Structure and Chemical reactions of carbohydrates.	4
	Vitamins Types (Water soluble vitamins and Fat soluble vitamins).	3
	Minerals Major and minor minerals, Metal uptake in canned foods, Toxic metals.	4
3	**Enzymes** Introduction, classification, General characteristics, Important enzymes in food processing.	4
	Browning Reactions in Food Types, Enzymatic and Non enzymatic Browning and their control measures.	4
	Changes occurring during food processing treatments Drying and dehydration, Irradiation, Freezing, Canning.	4
4	**Natural Food Pigments** Introduction and classification, Food pigments (chlorophyll, carotenoids, anthocyanin's and flavonoids, beet pigments, caramel) .	4
	Flavour Definition and basic tastes, Description of food flavours, Flavour enhancers.	3
	New product development Definition, Importance, Need of product development, Steps of product development-Product development tools Reasons for failure.	4

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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Program	B.Sc. – Food Technology	Branch/Spec.	Food Technology
Semester	2	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.

Pre-requisites

Nil

Scope and Objectives:

- To understand the role and significance of microbes of different categories, microbial inactivation and environmental factors that affect them in foods.

Learning Outcome:

- The student shall be able to understand the principles involving food spoilage and preservation involving microorganisms.

Syllabus- Theory

Unit	Content	Hrs
1	**Introduction to Food Microbiology** History and Development of Food Microbiology, Definition and Scope of food microbiology, Inter-relationship of microbiology with other sciences.	4
	Characteristics of Microorganisms in Food Types of microorganisms associated with food, their morphology and structure, Significance of spores in food microbiology.	5
	Microbial Growth in Food Bacterial growth curve and microbial growth in food, Factors affecting the growth of micro organisms in food.	4
	Microbial Food Spoilage 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	**Foodborne Disease** Types – foodborne infections, foodborne intoxications and toxic infections.	4
	Control of Microorganisms in Foods 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	**Food Fermentations** 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
	Trends in Food Microbiology Rapid Methods of Detection, Recent Advances.	4

Syllabus-Practical

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.
Text books	
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	2	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	-	-

Pre-requisites

Nil

Scope and Objectives:

- It aims at imparting the communication skills that are needed in their academic and professional pursuits.

Learning Outcome:

- The student will able learn how to approach their career with language proficiency.

Syllabus- Theory

Unit	Content	Hrs
1	**Communication Skills:** Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context **Barriers to communication:** Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers **Perspectives in Communication:** Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment	12
2	**Elements of Communication:** Introduction, Face to Face Communication - Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication **Communication Styles:** Introduction, The Communication Styles Matrix with example for each - Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style.	12
3	**Basic Listening Skills:** Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations. **Effective Written Communication:** Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion' Required, Shades of Meaning, Formal Communication . **Writing Effectively:** Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message.	12
4	**Interview Skills:** Purpose of an interview, Do's and Dont's of an interview. **Giving Presentations:** 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

Text books

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.