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<tr>
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<td><strong>Section A</strong></td>
<td>Multiple-Choice questions. Two questions from each unit</td>
<td>10 x 1 = 10 marks</td>
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<td><strong>Section B</strong></td>
<td>Short answer questions</td>
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<td>Definitions, explanation type questions</td>
<td>10 x 3 = 30 marks</td>
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<td>10 questions to be answered out of 12. Minimum of two questions from each unit</td>
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<td><strong>Section C</strong></td>
<td>5 questions – One from each unit. Internal choice</td>
<td>5 x 6 = 30 marks</td>
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<td>Paragraph, derivations, problems</td>
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<td><strong>Section D</strong></td>
<td>3 questions out of five. One question from each unit</td>
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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR  
DEPARTMENT OF FOOD SCIENCE & TECHNOLOGY

Question Paper Pattern for

*Core Elective, Allied, Non-Major Elective*

Time: 3 Hours Max Marks: 100

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| 1     | **Section A**  
Short answer questions  
Definitions, problems involving direct substitution, explanation type questions. 10 questions to be answered out of 12. Minimum of two questions from each unit | $10 \times 2 = 20$ marks |
| 2     | **Section B**  
5 questions – out of 7 questions  
Paragraph, derivations, problems | $5 \times 7 = 35$ marks |
| 3     | **Section C**  
3 questions out of five. One question from each unit | $3 \times 15 = 45$ marks |
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(Under Choice-Based Credit System from the Academic year 2015-2016 onwards)

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| Part – IV  |     |     |     |     |     |     | **10 Credits** |
| Non –major Elective | 04 |
| Skill Based Elective | 04 |
| Value Education | 02 |
| Total – IV |     |     |     |     |     |     | **10 Credits** |
| Part – V   |     |     |     |     |     |     | **02** |
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| Arise      | 01 |

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ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE
B.Sc., Food Science and Technology

Degree : B.Sc., Food Science and Technology  Part : III Core -1
Semester : I  Hours : 75
Subject Code: 15UFSC11  Credits : 4

Fundamentals of Food and Nutrition

Unit I
Basic terms used in study of food and nutrition Understanding relationship between food, nutrition and health. Functions of food-physiological, psychological and social. Concept of balanced diet.

Unit II
Nutrients –Classification, Functions, Dietary sources, RDA.
Clinical manifestations of deficiency and excess of the following in brief:
Fat soluble vitamins- A, D, E and K.
Water soluble vitamins - thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin C.
Minerals- Role of Ca, P, Fe, Na, K, I, F, Se.

Unit III

Unit IV

Unit V
Food preparation, understanding the principle involved. Nutrient losses in cooking. Effect of cooking and heat processing on the nutritive value of foods. Enhancing the nutritional quality of foods. Nutritional quality and portion size of: 10-12 dishes used in daily diet such as: chapatti, boiled rice, pulse preparation, curry preparation, seasonal vegetables, snacks, desserts.

Text Book
B.Srilakshmi, Food Science, New Age International Publishers (India), 2003

Books for Reference
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE
B.Sc., Food Science and Technology

Degree : B.Sc., Food Science and Technology Part : III Core -2
Semester : I Hours : 60
Subject Code:15UFSC21 Credits : 4

Principles of Food Science

Unit I

Unit II

Unit III
Fruits & Vegetables: Composition, Classification, Nutritive value, Vegetable Cookery, Changes during cooking, Ripening, Changes during ripening. Spices:Definition, Classification, Chemical composition, use of spices.
Sugar- Nutritive value. Sugar cookery. Artificial sweeteners.

Unit IV

Unit V
An elementary introduction to Functional foods, Prebiotics, Probiotics, Nutraceuticals. Organic Foods and GM foods

Text Book
B.Srilakshmi, Food science, New Age International Publishers (India), 2003

Books for Reference
Food and Nutrition Laboratory

1. Nutritional Quality of dishes daily used.
2. Diet planning of adult male/female
3. Assessment of weight and height and calculation of BMI.

Food Science Laboratory

1. Determination of moisture using i) hot air oven ii) distillation method
2. Determination of acidity and pH.
3. Determination of TSS
4. Qualitative tests for carbohydrates and proteins.
5. Analysis of Lipids. Iodine value, saponification value, peroxide value and free fatty acids.
6. Kjeldhal analysis of proteins
7. Analysis of water – total solids, acidity, alkalinity, hardness
8. Ash content of foods
9. Fat estimation
10. Dietary fibre estimation
11. Food energy estimation using Bomb calorimeter
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE
B.Sc., Food Science and Technology

Degree : B.Sc., Food Science and Technology Part : III Allied-1
Semester : I Hours : 45
Subject Code: 15UFSA11 Credits : 3

Principles of Food Production

Unit I


Hierarchy and Staffing: Kitchen Classical Brigade, Staffing in Various Category, Role of Executive Chef, Duties and Responsibilities of various Chefs, Co-operation with Other Departments

Equipment, Fuel and Tools used in Cookery.

Unit II

Shortenings (Fats & Oil): Role of shortening. Varieties of shortenings. Advantages & Disadvantages of using different shortenings, Fats & Oil Types, varieties.

Raising agents: Classification of raising agents, Action and reactions.

Sugar: Importance of sugar, Types of sugar, Cooking of various sugar.

Milk, Cream, Butter and Cheese: types and uses

Classification of vegetables, Pigments and colour changes Effects of heat on vegetables, Cuts of vegetables, Classification of fruits Uses of fruit in cookery, Salads & Salad dressings.

Rice, cereals & pulses, Flour: Uses of flour in food production, Cooking of flour.

Unit III


Methods & Principles of Cooking Food – Roasting, Grilling, Frying, Baking, Broiling, Poaching, Boiling, Steaming, Stewing and Braising.
Unit IV

Fish- Classification, selection procedures, cuts, and cooking of fish.

Butchery- Selection cuts, size, and uses of lamb, mutton, veal, beef, and porks.

Chicken- Classification, Selection procedures, cuts, and uses. Steak, Bacon, ham, gammon-

Meaning.

Unit V

Basic Indian and Continental Cookery.

Condiments & Condiments & Spices - Introduction to Indian Foods, Spices used in Indian
Foods, Role of Spices in Indian Cookery

Masalas - Blending of Masalas, Different Masalas used in Indian Cookery.

Thickening Agents - Role of Thickening Agents in Indian Cookery, Types of Thickening
Agents

Stock: Definition, Classification and types, Rules for stocks, Recipe of different stocks

Soups: Definitions, Classification of soups; Examples.

Sauces: Definition, Use and importance of sauces. Mother sauces- Recipes, Derivative
saucets.

Pasta: meaning and types

Books for Reference

Experiment No. 1

- Identification, Cutting & Blanching Vegetables
- Identification of Various Types of Vegetables
- Classification of Vegetables
- Cuts of Vegetables
- Blanching of Tomatoes & Capsicum

Experiment No. 2

Methods of Cooking Vegetables

- Boiling (potatoes, beans)
- Frying (potatoes)
- Steaming (Cabbage)
- Baking (potatoes)
- Braising (onion, cabbage)

Experiment No. 3

Preparation of Stocks and Sauces

- Demonstration and preparation of Stocks.
- Demonstration and preparation of Sauces.

Experiment No. 4

Identification of Fish, Poultry and Meat

- Identification of Fish
- Demonstration of Cuts of Fish
- Identification of Various Cuts of Poultry
- Identification of Various Cuts of Meat

Experiment No. 5

Preparation of Soups and Pasta

- Demonstration and Preparation of Various types Soups
- Demonstration and Preparation of Various Pasta Dish

Experiment No. 6

Indian Cookery

- Demonstration and Preparation of various Indian Masalas
Introduction to Biochemistry

Unit I


Unit II

Amino acids – Essential and nonessential amino acids. Peptide bond- isoelectric point.

Proteins – classification – primary, secondary, tertiary and quaternary structure-denaturation and re naturation of protein molecules.

Separation and purification of proteins – dialysis – gel filtration - electrophoresis.

Catabolism of amino acids: Transamination, oxidative deamination, decarboxylation. The urea cycle and other possibilities of detoxification of ammonia.

Unit III

Classification - neutral lipids, Phospholipids (lecithines, cephalins, plasmalogens) and glycolipids – importance.

Fatty acids – saturated, unsaturated fatty acids, EFA. Properties – Hydrolysis-acid number, saponification number. Auto-oxidation (Rancidity), addition reactions-Iodine value, Polenske number, Reichert- Meissel number, acetyl number. Hydrogenation
Metabolism: Oxidation of glycerol – β-oxidation of fatty acids; synthesis of fatty acids and synthesis of triglycerides.

Unit IV

Nomenclature, classification and properties-specificity, factors influencing enzyme action.


Unit V


Genetic code – mutations and mutants. DNA repair. Biosynthesis of proteins.

DNA sequencing and PCR, recombinant DNA technology, DNA polymorphism.

Books for Reference


@@@@@
Unit I

Historical development of food science and technology. Evolution of Food Processing from prehistoric times till date. Introduction to various branches of Food Science and Technology.

Unit II

Technological aspects of foods - uses and by-products of cereals and coarse cereals wheat grain and malting. Wheat milling and by-products. Gelatinization and dextrinisation of starch. Rice - Composition of rice obtained by different dehusking and polishing methods, parboiling of rice - advantages and disadvantages. By-products Millets - Uses of maize, sorghum, barley, oats, pearl millet and finger millet.

Unit III


Unit IV

Post-harvest changes in fruits and vegetables – Climacteric rise, horticultural maturity, physiological maturity, physiological changes, physical changes, chemical changes during the storage of fruits and vegetables.

Unit V

Meat - Definition of carcass, concept of red meat and white meat, composition of meat, marbling, post-mortem changes in meat - rigor mortis, tenderization of meat, ageing of meat. Fish - Classification of fish (fresh water and marine), composition of fish, characteristics of fresh fish, spoilage of fish - microbiological, physiological, biochemical. Poultry - composition and nutritive value, egg proteins, characteristics of fresh egg, deterioration of egg quality, difference between broiler and layers.

Books for Reference
2. B. Srilakshmi, Food science, New Age Publishers, 2002
Biochemistry Laboratory
1. Separation of biomolecules by electrophoresis (Demo)
2. Verification of Beer's law

Food Technology Laboratory
1. Adulteration tests for different foods:
   i. Milk and milk products
   ii. Tea and coffee etc.
2. To give the concept of shelf life of different foods (processed and unprocessed)
3. To study blanching and study the concept of Asepsis.
4. To perform pasteurization and sterilization of foods.
5. Quality evaluation/inspection of different foods.
   i. Spices and Condiments
   ii. Pulses
   iii. Nuts and oilseeds
   iv. Tea and coffee
6. Study of different types of browning reactions.
7. Changes in pigments during cooking and post-harvest changes in fruits and vegetables
   Fresh and stale. Effect of extent of boiling
   Eggs-
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

B.Sc., Food Science and Technology

Degree : B.Sc., Food Science and Technology  Part : III Allied-2
Semester : II  Hours : 45
Subject Code: 15UFSA22  Credits : 3

Fast Foods and Catering Services

Unit I


Unit II

Unit III

Unit IV

Unit V

Books for Reference
1. Thangam E. Philip., Modern Cookery for Teaching and Trade, Volumes I and II. Orient Longman.

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ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR  
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE  

B.Sc., Food Science and Technology  

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**Fast Food Lab**

1. Preparation of flavoured Milk.  
2. Preparation of Khoa and Paneer  
3. Preparation of Common varieties of ice-creams.  
4. Preparation of non-alcoholic beverages  
5. Kadai and Tawa preparations  
6. Preparation of Pizza, burger, French fries, cutlets, pasta.  
7. Preparation of Indian, Chinese and continental fast foods  
8. Fruit products
Food Engineering

Unit I
Introduction - Concept of Unit operation - Units and dimensions, Unit conversions, dimensional analysis, Mass and Energy Balance.
Design of food plant - Important considerations for designing of food plants - Construction and design - Types of layout.
Grinding and mixing - Principle and equipment used in food industry.

Unit II

Unit III

Unit IV

Unit V

Books for Reference
Technology of Cereals, Pulses and Oilseeds

Unit I
Technology of cereals: Introduction-Wheat -Types , milling, flour grade, flour treatments (bleaching, maturing), flour for various purposes, technology of dough development. Rice - Physicochemical properties , milling (mechanical & solvent extraction), parboiling, ageing of rice, utilization of by-products.

Unit II

Unit III
Technology of Pulses. Milling of pulses -- Dry milling --Wet milling -- Improved milling method.

Unit IV
Technology of Oilseeds. Introduction. Extraction of oil and refining Sources of protein (defatted flour, protein concentrates and isolates), properties and uses, protein texturization, fibre spinning.

Unit V

Books for Reference
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

B.Sc., Food Science and Technology

Class : II year  Part : III Core Lab-3
Semester : III  Total hours : 60
Code : 12FSP332  Credit : 2

Pulses, Cereals and oil seeds Laboratory

1. Determination of refractive index and specific gravity of fats and oils
2. Determination of smoke point and percent fat absorption for different fats.
3. Physical characteristics of wheat
4. Moisture content of wheat and wheat products
5. Estimation of gluten content
6. Physical characteristics of rice
7. Cooking quality of rice.

Food Engineering Laboratory

1. Plant layout design
2. Determination of viscosity of Newtonian and non-Newtonian fluids.
3. Effect of temperature on viscosity
4. Study of evaporation process.
5. Determination of freezing characteristics.
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR – 625 514
DEPARTMENT OF MATHEMATICS

Mathematical Statistics
(From 2012-2013 onwards)
(A one-semester course for Food Science and Technology Major Students)

Class : B.Sc. FST  Part : III/Core
Semester : III  Hours : 60
Subject Code : 12FSC333  Credits :

Objective : To give the basic concepts in algebra, calculus and statistics.

Course Outline:

Unit 1: Matrices – basic concepts – types of matrices – operations on matrices – transpose of a matrix  
(12 hours)

Unit 2: Determinants and their properties – rank of a matrix – minors and cofactors – inverse of a matrix – solving a system of linear equations – Cramer’s rule
(12 hours)

(12 hours)

Unit 4: Measures of central tendency – arithmetic mean, mean, median and mode
(12 hours)

Unit 5: Measures of dispersion – range – quartile deviation – standard deviation
(12 hours)

Text Books:
   Unit 1 and 4: Chapter 9

   Unit 3: Chapters 3.3, 3.4, 3.5

   Unit 3: Chapters 2.1, 2.2

   Unit 4: Chapter 2.1 – 2.3
   Unit 5: Chapter 3.1 except mean deviation
Bakery and Confectionary Products

Unit I

Unit II
Make-up techniques-Hard rolls & breads, soft roll dough, sweet dough products, rolled in dough products.

Unit III
Cakes and Cake decoration. Sponges: Preparation methods, types
Icings: Types (Fondant, butter creams, foam. Flat, fudge, royal icing, marzipan, meringues, glazes, fillings). Assembling and icing cakes: Selection of icing, procedure for assembling layer cakes, small cakes and sheet cakes. Cake decoration: Colour, design, templates, texture, equipment, casting molds, lettering, monogram, stencils.

Unit IV
Cookies, Pies and Tarts. Cookies: Characteristics & causes, mixing methods, types & make-up, panning, baking and cooling, formulas for bar cookies, macaroons, lace cookies, sandwich cookies.
Pies: Types, mixing pie dough, pie crust, procedure for making small fruit tarts, assembling, baking & filling, common problems in fruit pies. Tarts & tartlets: Preparation and types.

Unit V

Books for Reference
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

B.Sc., Food Science and Technology

Class: II year  Part: III Allied Lab-3
Semester: III  Total hours: 30
Code: 12FAP132  Credit: 1

Bakery and Confectionary Products Laboratory

Formulate 10 sets of bakery dishes consisting of 2 items from the below for each practical:
- Bread varieties
- Muffins
- Pizza
- Croissant
- Danish pastry
- Biscuits(any two varieties)
- Doughnuts
- Brownies
- Cream horns
- Jam buns
- Black forest cake
- Christmas cake
- Cheese straws
- Melting moments
- Marshmallows
- Cherry cake
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

B.Sc., Food Science and Technology

Class : UG Other Arts/Science  Part : IV NME-1
Semester : III  Total hours : 45
Code : 12FNEA32  Credit : 2

Non Major Elective: Basics of Food Science

Unit I
Food – Functions –Classification of Foods based on sources and functions- Basic Five Food Groups – Food Guide Pyramid.

Unit II
Nutrients – Types- Major nutrient (Carbohydrates, Proteins and Fat) and minor nutrients (Vitamins and minerals)- functions and sources.

Unit III
Cereals and millets- Rice, Wheat, Maize, Ragi, Bajra – composition and uses.
Pulses – composition and functions.

Unit IV
Fruits and vegetables – classification based on pigments – botanical classification-
Selection of fruits and vegetables- role of vegetables and fruits in cookery.

Unit V
Milk and milk products – composition and function.
Flesh foods- Meat, Fish, Egg, Poultry - composition and function.
Sugar and Jaggery- Uses.

Text Book
Study material given by course teacher
Food Processing and Engineering

Unit I
Thermal Processing - Thermal Processing Principles & application— Blanching, Pasteurization, Sterilization (Canning and Bottling), Ultra high temp sterilization, Aseptic processing, Canning and bottling.

Unit II
Drying- Significance: Natural drying- Solar drying, Artificial drying- Hot air drying, Drum drying, Spray drying, Dehydrofreezing, Freeze drying Pre treatments blanching, sulphuring
Quality of frozen foods- Retrogradation, Protein denaturation, Freezer burn.

Unit III
Chemical Preservation: Types of Preservatives, Class I and Class II Preservatives, Chemical preservatives- Sulphur dioxide, Benzoic acid, Sorbic acid. Antioxidants.

Unit IV
Irradiation - Source of ionization irradiation, Dose & Dosimetry, Mode of action, Scope of irradiation.
Fermentation - Principles, Types of fermentation, Types of fermented foods, Advantages of fermentation.

Unit V
Recent Trends Pulsed electric fields, High pressure technology, Ohmic heating, Microwave heating, Hurdle technology.

Books for Reference
1. Vijayakhader, Food Storage and Preservation
2. B. Srilakshmi, Food science
3. Desrosier, Food preservation
4. Fennema, Physical principles of food preservation
5. Complete Technology Book on Processing, Dehydration Canning and Preservation of Fruit & Vegetables NIIR.
Technology of Fruits, Vegetables and Plantation Crops

Unit I
Introduction - Importance of fruits and vegetable, history and need of preservation. Reasons of spoilage. Methods of preservation (short & long term).

Tomato products: Selection of tomatoes, pulping & processing of tomato juice, tomato puree, paste, ketchup, sauce and soup.

Unit II
Fruits beverages - Processing of fruit juices (selection, juice extraction, deaeration, straining, filtration and clarification. Preservation of fruit juices (pasteurization, chemically preserved with sugars, freezing, drying, tetra-packing, carbonation). Processing of squashes, cordials, nectars, concentrates and powder.

Unit III

Pickles, chutneys and sauces: Processing, Types, Causes of spoilage in pickling.

Unit IV
Dehydration of fruits and vegetables. Sun drying & mechanical dehydration process variation for fruits and vegetables packing and storage.

Unit V

Books for Reference
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR  
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE  

B.Sc., Food Science and Technology  

<table>
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Fruits, Vegetables and Plantation Crops Laboratory  
1. Estimation of pH and acidity of products  
2. Estimation of brix: acidity ratio  
3. Estimation of ascorbic acid and effect of heat treatment on it.  
4. Preparation and evaluation of pectin products  
5. Adulteration of spices.  
6. Dehydration of fruits and vegetables.

Dairy Products Laboratory  
1. Analysis of milk – acidity, COB, MBRT, SNF, specific gravity  
2. Estimation of milk protein by Folin method  
4. To prepare casein and calculation of yield.

Food Processing and Engineering Laboratory  
1. Comparison of conventional and microwave processing of food  
2. Drying of food using tray drier  
3. Osmotic dehydration  
4. Cutout analysis of canned food
Dairy Technology

Unit I
Milk - Definition, composition of milk, important characteristics of major constituents of milk. i.e. milk fat, milk proteins, lactose and minerals and minor constituents of milk. Factors affecting the quality and quantity of milk produced by milk animals. Physical, chemical and nutritive properties of milk.

Unit II

Unit III

Unit IV

Unit V

Books for Reference
1. Outlines of Dairy Technology by Sukumar De,1980, Oxford University Press, UK
ARUL ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

B.Sc., Food Science and Technology

Class : II year Part : III Allied-4
Semester : IV Total hours : 75
Code : 12FSA443 Credit : 3

Food Microbiology

Unit I
History and Development of Food Microbiology. Definition and Scope of food microbiology
Inter-relationship of microbiology with other sciences.

Unit II
Types of microorganisms, Classification and Nomenclature, Morphology and Structure and
their importance in food (bacteria, fungi, viruses and prions, protozoans and others).
Identification of bacteria by Gram Staining techniques, Microbial Growth in Food -
Microbial Growth Characteristics- Bacterial growth curve, microbial reproduction and
microbial growth in food. Factors affecting the growth of microorganisms in food.

Unit III
Microbial Food Spoilage . Sources of Microorganisms in foods. Some important food
spoilage bacteria. Spoilage of specific food groups- Cereal and cereal products, Milk and
dairy products, Meat, poultry and seafoods, Fruits and vegetables and Canned products.

Unit IV
Food borne Diseases. Types – food borne infections, food borne intoxications - Origin,
symptoms and prevention of some commonly occurring food borne diseases. Emerging
pathogens of concern. Control measures- sterilization and disinfection.

Unit V
Trends in Food Microbiology. Rapid Methods of Detection. SCP and SCO. Recent
Advances.

Books for Reference
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
   1993.
**Food Microbiology Laboratory**

1. Lab Rules and Regulations

2. Handling Techniques
   - Microscope
   - Autoclave
   - Laminar Air Flow
   - Incubator
   - Hot Air Oven
   - Micro pipettes
   - Petriplates
   - Inoculation loop
   - L-Rod
   - Preparation of cotton plug

3. Experiments
   - Gram Staining Techniques
   - Plating Techniques
   - Streaking Techniques
Non Major Elective: Basics of Food Science
II B.Sc., Physics, Mathematics and RDS

Unit I
Food – Functions – Classification of Foods based on sources and functions- Basic Five Food Groups – Food Guide Pyramid.

Unit II
Nutrients – Types- Major nutrient (Carbohydrates, Proteins and Fat) and minor nutrients (Vitamins and minerals)- functions and sources and Deficiency

Unit III
Pulses – composition, nutritive value and functions.

Unit IV
Fruits and vegetables – Composition and nutritive value- classification based on pigments – botanical classification- Selection of fruits and vegetables- role of vegetable and fruits in cookery.
Spices – Types and its role in cookery

Unit V
Milk and milk products – composition and function.
Flesh foods- Meat, Fish, Egg, Poultry - composition and function.
Sugar and Jaggery- Uses.

Text Book
Study material given by course teacher
OBJECTIVES

- To learn about the various technologies in meat and poultry
- To study the livestock and poultry characteristics
- To know about the slaughter process and preservation of meat and poultry products
- To study about the various meat and poultry products
- To know about the complete processing and quality analysis of egg

UNIT 1 (18 hours)

Meat: Livestock and poultry population in India, Development of meat and poultry industry in India and its need in nation’s economy, Glossary of live market terms for animals and birds.


UNIT II (18 hours)


UNIT III (18 hours)


UNIT IV (18 hours)

Slaughter process: Slaughter, inspection and grading, Anti-mortem examination of meat animals, slaughter of buffalo, sheep/ goat, poultry, pig. A Generic HACCP model, dressing of carcasses, post-mortem examination of meat, different cuts of pork, beef, mutton, chicken.

Preservation of meat- Refrigeration and freezing, thermal processing- canning of meat, retort pouch, dehydration, irradiation, and RTE, Dressing of chicken, carcasses.
Unit V  

**Egg Industry and Egg Production Practices** - BCC, ECC  The egg industry, its techniques of working, General management, Structure, Lampostion and nutritive values of egg and its products

Preservation of eggs - Refrigeration and freezing, thermal processing, dehydration, coating.

Quality identification and defects of shell eggs. Factors affecting egg quality and measures of egg quality.

**Books for Reference**


3) Pearson & Gillet Processed Meats, 3 Ed, CBS Publication, New Delhi, 1997

4) Shai Barbut, Poultry Products Processing, CRC Press 2005


Poultry and Meat Laboratory

1. Estimation of moisture content of meat.
2. Cutout analyses of canned meat/retort pouches
3. Estimation of protein content of meat
4. Analysis of frozen meat/meat emulsion products
5. To study shelf-life of eggs by different methods of preservation.
7. To perform freezing of yolk/albumen

Food safety Laboratory

1. Microbiological examination of different food samples.
2. Bacteriological analysis of water.
OBJECTIVES

- To know about the various hazards involved in the contamination of food.
- To study about the transmittance of pathogens by food.
- To know about the hygienic conditions to be maintained for the safety of the food.
- To get awareness regarding the analysis of food for its safety.
- To study about the laws involved in maintaining the standards of the food.

Unit I (18 hours)

Food Safety: Introduction and Definition, Types of food hazards-biological, chemical, physical hazards

Physical Hazards with common examples. Chemical Hazards (naturally occurring, environmental and intentionally added).

Factors affecting Food Safety. Importance of Safe Foods.

Impact on health. Control measures

Unit II (18 hours)


Unit III (18 hours)

Microbiological criteria –MRA. Microbiological standards and limits (for processed food, water)

Microbiological Assessment and categories of food based on microbial quality. Assessment of Surface Sanitation and Personal Hygiene.

Unit IV (18 hours)

Management of hazards: Need, Control of parameters – pH, water, Air, Temperature control.
Hygiene and Sanitation in Food Service Establishments – Sources of contamination


Unit V (18 hours)

Food Storage, preservation and safety: Preservation process and food storage

Recent developments in food safety, food storage and food preservation aspects

Recent outbreaks in food products

Books for Reference

1. Lawley, R., Curtis L. and Davis, J. The Food Safety Hazard Guidebook, RSC publishing, 2004


OBJECTIVES

- To study about the various quality attributes & Food Appearance of food.
- To learn about the organs involved in taste perception and their chemical dimensions.
- To study about the effectiveness of various olfactometer.
- To know about the colors to be incorporated in the food.
- To study about rheological models and texture analysis of food.

Unit I (18 hours)

Introduction to quality attributes - Appearance, flavour, textural factors and additional quality factors.

Appearance – Concept and Importance of Food Appearance, Sensory Assessment of Appearance- panel selection, screening and training; Physical requirement for food appearance, types of sensory test, Appearance Scales.

Unit II (18 hours)

Taste - Introduction, Organs involved in taste perception- tongue, papillae, taste buds, salivary glands mechanism of taste perception. Chemicals responsible for sweet, salt, sour, and bitter taste their structure and chemical dimensions. Factors affecting taste quality, reaction time and factors affecting it. Absolute and recognition threshold taste abnormalities.

Unit III (18 hours)

Olfaction - Introduction and definition, anatomy of nose, mechanism of odour perception. Prerequisites for odour perception, odour classification, chemical specificity of odour. measurement of odour using different techniques primitive, double tube olfactometer,
Elseberg techniques, Wenzel’s olfactometer, sniffing, merits and demerits of each methods, olfactory abnormalities.

Unit IV (18 hours)

Colour - Introduction to natural and synthetic colours. Functions of colour in foods. Optical aspect of colour, perception of colour, objective evaluation, colour measurement using different systems- Munsell colour system, CIE colour system, qualitative and quantitative analysis of colour, reflectance spectrophotometry and Colorimetry.

Unit V (18 hours)

Texture - Introduction, Definition and classification of texture profile. Subjective evaluation, phases of oral processing. Objective analysis, rheological methods of texture measurement including rheological models. Measurement of texture in various food groups viz. cereals, dairy, fruits and vegetables, fish, meat and meat products.

Books for Reference


Food Quality Management

Unit I  
(12 hours)

**Food Quality**: Introduction to food quality management - Definition, quality concepts, quality, quality perception, quality attributes, safety, health, sensory, shelf life, convenience, extrinsic attributes, factors affecting food quality. Total food quality management functions.

Unit II  
(12 hours)

**Food contamination**: Contamination in Food- : Physical, Natural toxins, chemical, heavy metals, antibiotics, dioxins, environmental pollutants. Contaminants formed during processing nitrosamines, acrylamide, contaminants form packaging materials.

Unit III  
(14 hours)

**Food Additives**: Meaning, Need, Classification, Characteristics and classification of food additives.

Antimicrobial agents – Nitrites, sulphides, sulphur di oxide, sodium chloride, hydrogen peroxide.

Antioxidants - Introduction, mechanism of action, natural and synthetic anti-oxidants, technological aspect of antioxidants.

Sweeteners- Introduction, importance, classification- natural and artificial.

Colors- Importance, classification- natural, artificial colours
Unit IV

(8 hours)

GRAS (Generally Recognised as Safe). Permissible limit for Food additives. ADI, LD50.

Unit V

(14 hours)


Books for References

ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR
DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

B.Sc., Food Science and Technology

Degree : B.Sc., Food Science and Technology
Semester : V
Subject Code: 12FSP552

Part : III Core Lab-6
Hours : 60
Credits : 2

Food Quality Testing Laboratory

1. Training of sensory panel for favor perception.
2. To perform sensitivity tests for four basic tests.
3. Sensory Evaluation of milk and detection of various favour defects.
4. Extraction of pigments from various fruits and vegetables and influence of heating time and pH.
5. Sensory evaluation of biscuit samples for textural properties.
6. Textural evaluation of various food products using texturometer,
7. Simple tests for detection of common adulterants – formaldehyde, starch, cane sugar, hydrogen peroxide, sodium bicarbonate in milk.
9. Estimation of pesticide residues in food/water
10. Estimation of benzoic acid in foods.

Books for Reference

Technology of Sea Foods

Unit I (14 hours)
Classification of fish, Nutritional value of different types of fish, Characteristics of fresh fish.

Unit II (18 hours)
Low temperature preservation: Freezing on board, Onshore processing, Chilling and Freezing of fish. Relationship between chilling and storage life, general aspects of freezing. Changes in quality in chilled and frozen storage, thawing.

Unit III (20 hours)
Canning of fish: Principles of canning, classification based on pH groupings, effect of heat processing on fish, storage of canned fish, pre-process operations, post process operations, cannery operations for specific canned products (Tuna). Drying and salting of fish- salting process, salting methods, preservation by smoking.

Unit IV (20 hours)
Fishery by-products: Surimi- Introduction, fish muscle proteins, the surimi production process, traditional and Fish protein concentrates (FPC), fish protein extracts (FPE), fish protein hydrolysate (FPH). Fermented fish. Fish sauce and Paste

Unit V (18 hours)

Books for Reference

ANANDAR COLLEGE (AUTONOMOUS), KARUMATHUR

DEPARTMENT OF RURAL DEVELOPMENT SCIENCE

B.Sc., Food Science and Technology

Degree : B.Sc., Food Science and Technology  Part : III Core Lab-7
Semester : VI  Hours : 60
Subject Code: 12FSP262  Credits : 2

Sea Food Laboratory

1. Quality evaluation of fish/prawn
2. Subjective evaluation of fresh fish.
3. Cutout examination of canned fish – sardine, tuna and Mackerel.
4. Fish product formulation/ canning
OBJECTIVES

- To learn about the Concept of Entrepreneurship and Managing creativity.
- To know about Small Business and Franchising.
- To study about the Project, Project Identification, Project Appraisal & Project costing.
- To know about the arrangement of Funds & Loans.
- To know about the role of various Financial Institutions and Banks

Unit I (18 hours)


Unit II (18 hours)


Unit III (18 hours)


Unit IV (18 hours)

**Industrial Finance**: Arrangement of funds: Traditional sources of financing – Equity shares, preference shares, Debentures/bonds, loan from financial institutions- Loan syndication and consortium finance; Alternative sources of financing- Foreign Issue, FDI & FII, ECB, Private equity, Securitization, BOT projects, PPP, Venture capital / Incubation fund, Franchising. Role played by various Financial Institutions like IDBI, IFCI, SFCS, SIDBI and Commercial Banks.

Unit V (18 hours)

**Project Implementation and Global Business**

**Project Implementation**: Project contracts – Principles, practical aspects of contacts, legal aspects of project management, global tender, Negotiation for projects, Project insurance, Human resource management, network analysis.

Books for Reference
1. Scarborough & Zimmerer, Effective Small Business Management
2. Gupta & Srinivasan, Entrepreneurial Development
3. Pickle & Abrahamson, Small Business Management
4. Vasanth Desai, Dynamics of Entrepreneurial Development & Management
5. John Kao, Creativity & Entrepreneurship
6. P. Chandra, Projects planning analysis selection implementation & review
8. N. Singh, Project management & control, (Himalaya pub.)
In-Plant Training and Project Work

Students of B. Sc., Food Technology should undergo a project work for a period of 30 days during the VI semester. The purpose of the programme is to get hands-on experience on various aspects of food industries that form the strong foundation for the young food technologists. The Department will allot students to the industry, in consultation with the industry concerned and based on merit of the students. The selected student should report for the programme on the stipulated date and attend the programme regularly without any lapse. On completion, each student should prepare a project report duly certified by the supervisor in the industry. The Department may also allow the student to carry out a project under the guidance of the Department faculty

Consequently, a seminar should be conducted in the department to present the finding of the project work. The bonafide project report attested by the Head of the department will be evaluated by the external examiner and a viva voce will be conducted.
OBJECTIVES

- To know about the behaviours of Consumer.
- To know about Marketing methods.
- To learn about the Global market status, & role of export promoting agencies
- To know about the Marketing and Sales Management.
- To learn about the Role of advertisements and technologies in Marketing.

Unit I

(12 hours)

Consumer Behaviour: Classification of consumers – domestic-foreign-residents of urban area, cosmopolitan and rural area. Their liking towards products.

Unit II

(12 hours)


Unit III

(12 hours)


Unit IV

(12 hours)


Unit V

(12 hours)

Advertisement and Sales Promoters: Role of advertisements and technologies in promotion of new products. Market promotion and positioning of food products.

Books for Reference

1. Sherieker, Marketing Management
2. Vandevan, Marketing Research management
3. Acharya, Agricultural Marketing.