Post Graduate Diploma in Food Safety and Nutritional Quality Management (PGDFSQM)

Programme Code PGDFSQM
Programme Duration (in yrs.) Minimum: 1 Maximum: 3
Medium of instruction : English/Hindi
Assignment Work –Essential

Year	Course Code	Title of the Course	Credits
One Year Course	PGDFSQM-01	Food Fundamentals & Chemistry	4
	PGDFSQM-02	Food Microbiology	4
	PGDFSQM-03	Food Laws and Standards	4
	PGDFSQM-04	Principles of Food Safety and Quality Management	4
	PGDFSQM-05	Food Safety and Quality Auditing	4
	PGDFSQM-06	Chemical Analysis and Quality Assurance	4
	PGDFSQM-07	Institutional Management in Dietetics	8

POST GRADUATE DIPLOMA IN FOOD SAFETY AND NUTRITIONAL QUALITY MANAGEMENT

PROGRAMME OUTCOMES (PO):

After Completion of the PGDFSQM programme learner should be able to:

PO1: Comprehend the issues of safety and quality in food production, handling, processing and trade.

PO2: Build technical proficiency in undertaking in food safety and quality assurance in food processing chain i.e., from farm to fork.

PO3: Ensure the safety and quality of food products as per mandatory legal requirements and voluntary standards including export regulations if required.

PO4: Design and implement

–Good Hygienic Practices (GHP)

–Good Manufacturing Practices (GMP)

–Hazard Analysis and Critical Control Point (HACCP)

–Quality Management Systems (QMS) : ISO 9001

–Food Safety Management Systems (FSMS) ISO 22000

–Laboratory Management System : ISO 17025

–Retail Standards

PO5: Be able to effectively plan, conduct, report and audit as per the guidelines of the ISO19011:2002

PO6: Undertake Standard Microbiological and Chemical analysis of Food Products.

PO7: Apply Good Hygienic, Manufacturing, Laboratory, Transportation and Retail Practices in Food Processing/Hospitality industry and Retail outlets.

PAPER - ONE

FOOD FUNDAMENTALS AND CHEMISTRY

BLOCK-1 INTRODUCTION TO FOOD SCIENCE

UNIT 1 FOOD BASICS

Introduction, Food Source , Food Chain , Food Safety , Food Constituents (Moisture, Carbohydrates, Proteins, Lipids ,Vitamins, Minerals), Food and its Functions (Physiological Functions, Psychological Functions, Social Function), Sacred Foods and Food taboos , Food as Source of Nutrients (Carbohydrate Rich Food, Protein Rich Food , Fats and Oil Rich Food , Vitamins and Mineral Rich Food), Cuisines, Consumption Trends, Food Industry, Processing and Value Addition, National Food Processing Policy, Food Trade

UNIT 2 FOOD FROM PLANT SOURCES

Introduction, Food Grains, Cereals (Structure and Composition of Cereals, Post Harvest Processing, Foods from Cereals), Grain Legumes (Composition of Legumes, Processing Pulses), Oilseeds: Characteristics (Processing of Oilseeds), Horticultural Crops: Structure and Composition, Post Harvest Technology

UNIT 3 FOODS OF ANIMAL ORIGIN

Introduction, Food Safety, Meat and Meat Products (Livestock, Poultry and Meat Production, Wholesome Meat Production, Processed Meats), Eggs and Egg Products (Egg Quality, Shell Egg Processing, Spoilage and Preservation of Shell Egg, Packaging and Transport of Shell Eggs, Egg Products, Manufactured Egg Products), Milk and Milk Products(Clean Production of Market Milk, Milk Processing, Dairy Plant Sanitation Programme), Fish and Fishery Products(Aquatic Animal Production, Processing, Deterioration of Fish and Shellfish)

UNIT 4 OTHER FOODS

Introduction, Comfort Foods (Energy Foods/ Drinks, Stimulating Drinks, Alcoholic Beverages), Health Foods, Nutraceuticals (Types of Functional Foods and their Health Benefits, Concerns and Regulations Regarding Nutraceuticals), Ayurvedic Medicinal Foods (History, Composition, Safety Concerns),Traditional Indian Foods, Honey(Composition, Uses and Health Benefits, Safety Concerns),Genetically Modified Foods (Technology, Benefits, Risks, Regulations),Infant Foods(Traditional Infant Foods, Commercial Infant Foods and Formulae, Concerns, Regulations), Organic Foods(Advantages, Concerns, Regulations)

BLOCK-2 FOOD CHEMISTRY

UNIT 5 WATER

Introduction, Water: Structure and Properties, Water in Foods (Types of Water in Foods, Moisture Content), Water Activity (Definition of Water Activity, Measurement of Water Activity), Sorption Isotherms, and Food Spoilage: Role of Water Activity, Water Quality and Standards: Physicochemical and Biological Parameters of Water Quality, Water Standards

UNIT 6 CARBOHYDRATES

Introduction, Occurrence, Structure and Classification, Physicochemical Properties of Carbohydrates: Absorption of Water, Solubility, Mutarotation, Inversion of Sugar, Taste, Crystallization, Effect of Heat, Effect of Food Processing on Carbohydrates(Effect on Starch, Effect on Dietary Fibre), Application of

Carbohydrates in Foods(Use of Sugars in Food, Food Applications of Starch Polysaccharides, Food Applications of Non-starch Polysaccharides), Nutritional and Clinical Importance of Carbohydrates.

UNIT 7 PROTEINS AND ENZYMES

Introduction, Occurrence of Proteins, Plant Sources, Animals Sources, Microbial Sources Classification of Proteins: on the Basis of Shape and Size, Products of Hydrolysis and Biological Functions.

Structure of Proteins (Amino Acids, Peptides, and Structural Organization of Proteins), Properties of Proteins: Physico-chemical Properties of Proteins, Functional Properties of Proteins, Food Applications of Protein Concentrates, Isolates and Hydrolysates

Enzymes (Nomenclature and Classification of Enzymes), Enzyme Utilization in Food Industry(Immobilized Enzymes, Enzymatic Browning)

UNIT 8 LIPIDS

Introduction, Occurrence and Sources, Classification of Lipids (Simple, Complex and Derived Lipids) Structure of Lipids(Fatty Acids, Acylglycerols),Properties of Lipids: Physical Characteristics, Chemical Reaction and Fat Constants, Deteriorative Changes in Fats and Oils and their Prevention(Auto-oxidation, Lypolysis and Thermal Decomposition, Antioxidants), Applications in Foods and Nutrition, Adulteration of Fats and Oils

UNIT 9 VITAMINS AND MINERALS

Introduction, Classification of Vitamins, Fat Soluble Vitamins (Physiological Importance of Fat Soluble Vitamins, Food Applications of Fat Soluble Vitamins), Water Soluble Vitamins(Physiological Importance of Water Soluble Vitamins, Food Applications of Water Soluble Vitamins), Classification of Minerals(Major minerals : Physiological Importance and Food Applications, Trace elements : Physiological Importance and Food Applications), Effect of Food Processing on Vitamins and Minerals, Toxic Metals: Sources and Symptoms, Metal Uptake from Canned Foods, food Fortification – Need and Types

UNIT 10 FOOD ADDITIVES

Introduction, What are Food Additives?, Preservatives, Antioxidants, Acidulates, Colouring Agents: Natural Colorants, Synthetic Colorants, Flavouring Agents, Sweeteners: Nutritive Sweeteners, Non-nutritive Sweeteners, Miscellaneous Additives

BLOCK-3 FOOD ANALYSIS

UNIT 11 SAMPLING TECHNIQUES OF FOOD PRODUCTS

Introduction, Sample Collection: Homogenous Versus Heterogeneous Populations, Manual Versus Continuous Sampling, Importance of Sample Collection, Errors in Analytical Results due to Improper Sampling, Risks Associated with Sampling, Sampling Standards,The Sampling Plan: Understanding a Sample Plan, Statistical Approaches, Sampling Techniques/Methods:Probability Sampling, Non-probability Sampling, Types of Sampling, Operating Characteristic (OC) Curves, Requirements of Good Sampling Methods, Cost of Sampling, Problems in Sampling, Three Class Sampling Plan, Preparation of Sampling Plans, Model Sampling Plan, Sub Sampling for Analysis and Taking the Test Portion, Composite Lab Sample Preparation, Opinions of Experts, Sample Preparation for Analysis, Precautions to be Followed while Preparing a Sample for Analysis, Difficulties in Sampling, Example for Effect of Sampling on Analytical Result, Sample Accountability, Documentation, Chain of Custody Form, Sample Receipt and Handling Monitoring of Samples, Retention of Samples and Records: Identify the Properties of Retained Samples, Retention Period, Case Study

UNIT 12 PHYSICAL AND CHEMICAL ANALYSIS OF FOODS

Introduction, Physical Properties: Specific Gravity/Density, Specific Heat Capacity, Surface Tension, Viscosity, Refractive Index, Filth, Particle Size, Chemical Properties: Moisture, Water Activity, Protein, Fat, Volatile Oil, Crude Fibre, Dietary Fibre, Total Ash, Acid Insoluble Ash, Sulphated Ash, Reducing and Non-Reducing Sugars, Starch.

Physical and Chemical Properties of Oils and Fats: Acid Value and Free Fatty Acids,Unsaponifiable Matter, Melting Point, Solid-liquid Ratio, Specific Gravity, Titre Value, Colour, Iodine Value (Wij's), Saponification Value ,Acetyl Value and Hydroxyl Value, Reichert-Meissl (RM) Value, Polanski Value, Rancidity

UNIT 13 INSTRUMENTATION IN FOOD ANALYSIS

Introduction, Need for Food Analysis, Why do We Need Instrumentation in Food Analysis?, Selecting an Appropriate Instrumental Technique: Criteria for Selecting a Technique, Instrumental Techniques in Food Analysis, Chromatographic Techniques, Gas Chromatography, Detector for Gas Chromatography, Sampling Techniques, Applications of Gas Chromatography, Liquid Chromatography: Characteristic Features of HPLC, Comparison of HPLC and GC, A Typical Modern Liquid Chromatography, Detectors for HPLC, Applications of HPLC. Thin Layer Chromatography, High Performance Thin Layer Chromatography

(HPTLC),Hyphenated Techniques: Gas Chromatography-Mass Spectrometry (GC-MS), Liquid Chromatography-Mass Spectrometry (LC-MS), Spectroscopic Techniques: Distribution of Energy in Atoms and Molecules, Characteristics of Electromagnetic Waves, Interaction of Radiation with Matter, Measurement Modes , Spectroscopic Instruments : UV-Visible Spectroscopy, Atomic-Absorption Spectroscopy (AAS), Inductively Coupled Plasma – Optical Emission Spectrophotometer (ICP- OES/MS)

Nuclear Magnetic Resonance Spectroscopy (NMR), Fourier Transform Infrared Spectroscopy (FT-IR), Thermal Methods of Analysis: hermogravimetre, Differential Thermal Analysis (DTA), Differential Scanning Calorimetric (DSC).

UNIT 14 SENSORY EVALUATIONS OF FOOD PRODUCTS

Introduction, Selection of Panel, Types of Panel, Methodology for Sensory Evaluation, Maintaining Suitable Environmental Conditions, Laboratory Set-up and Equipment, Sample Preparation, Types of Tests: Analytical Tests, Affective (Preference and Acceptance) Tests, Applications of Sensory Evaluation

BLOCK-4 FOOD PROCESSING AND PRESERVATION

UNIT 15 INTRODUCTIONS TO FOOD PRESERVATION AND PROCESSING

Introduction, Methods of Food Preservation, Thermal Processing: Effect of thermal processing on microbial activity, Effect of thermal processing on enzyme activity, Effect of thermal processing on food quality.

Thermal Processes: Blanching, pasteurization and Sterilization

Thermal Death Time, Food Drying/ Dehydration: Heat requirement for vaporization, Heat transfer in drying , Drying and water activity 15.2.5 Cooling and freezing Air freezing, Plate freezing, Liquid-immersion freezing, Cryogenic freezing 15.2.6 Food Preservation using Chemicals: Salt and sugar preservation, Other preservatives, Minimal Processing of Fresh Foods, Other Emerging Techniques (Modified atmosphere packaging, Genetic engineering) Emerging Technologies for Minimally Processed Fresh Fruit Juices, Pulsed electric field, High hydrostatic pressure .

UNIT 16 FOOD PACKAGING

Introduction, Need for Packaging of foods, Types of Packaging, Forms of Packaging, Choosing an appropriate packaging material, Packaging and consumer needs(Attributes that consumer appreciate,

Packaging materials for different food products), Packaging Material(Flexible Packaging Materials, Rigid Packaging Materials, Semi Rigid Packaging Materials), Some Modern Packaging Concepts(Form-fill-seal system, Aseptic packaging technique, Retort packaging for long life foods), Modified Atmosphere Packaging, Active and Intelligent Packaging :techniques, Current use of novel packaging techniques, Labelling, Bar Coding in Packaging, Packaging and Environment, Edible Packaging of Foods (Advantages, Requirements of edible films and coatings, Materials for edible films), Biodegradable Plastics, Recycling of used Packaging Materials, Packaging Machines

UNIT 17 WASTE FOOD PROCESSING MANAGEMENT IN INDUSTRY

Energy Efficiency and Conservation, Water Conservation, By-product Utilization, Treatment of Solid Wastes, Treatment of Liquid Wastes, Corporate Social Responsibility

PAPER TWO

FOOD MICROBIOLOGY

BLOCK ONE – FUNDAMENTALS OF FOOD MICROBIOLOGY

UNIT 1 INTRODUCTION TO FOOD MICROBIOLOGY

Introduction, The Science of Microbiology, Food Microbiology - its Origins and Scope, Importance of Micro-organisms in Foods, Classification and Nomenclature of Micro-organisms, Micro-organisms in Food, Bacteria, Molds, Yeasts, Viruses, Parasitic Organism, Important Micro-organisms in Food, Important Mould Genera, Important Yeast Genera, Important Viruses, Important Bacterial Genera, Normal Micro flora of some Common Foods,

UNIT 2 FOOD CONTAMINATION ANDSPOILAGE

Introduction,Food Contamination,Contamination of Living Plants and Animals,Sources of Contamination,Food Spoilage,Types of Spoilage,Classification of Foods on the Basis of Stability,Role of Micro-organisms,Micro-organisms Involved in Spoilage,Growth of Micro-organisms,Factors Affecting

Spoilage,Extrinsic Factors,Intrinsic Factors,Interaction Among Growth Factors,Deteriorative Effect of Micro-organisms,Physical Changes,Chemical Changes,Different Types of Spoilage,Common Methods of Food Preservation

UNIT 3 FOOD-BORNE DISEASES

Introduction,Food-borne Diseases and the Agents,Diseases by Bacteria,Diseases by Molds,Diseases by Viruses,Diseases by Parasites,Diseases by Natural toxins,Types of Food-borne Diseases,Common Food-borne Pathogens and their Symptoms,Factors Responsible for Food-borne Diseases,Emerging Food-borne,Pathogens,Examples of Emerging Food-borne Pathogens, Antimicrobial Resistance and Food-borne Pathogens,

UNIT 4 BENEFICIAL ROLE OFMICRO-ORGANISMS

Introduction,Fermentation,Fermented Foods and their Importance,Food Fermentation-Science and Technology,Types of Food Fermentations,Acid Food Fermentation,Yeast food fermentation,Solid State Fermentation,Common Examples of Food Fermentation,Oriental and Indigenous Fermented Foods,Fermented Vegetable Foods,Fermented Soya Bean Products,Fermented Dairy Products,Economically Important Fermented Foods,Fermented foods as Functional Foods,Probiotics,Prebiotics,Synbiotics,Use of Probiotics,Health Benefits of Probiotics

BLOCK- TWO ANALYTICAL TECHNIQUES IN MICROBIOLOGY

UNIT 5 GENERAL TECHNIQUES OF DETECTION AND ENUMERATION OF MICRO-ORGANISMS IN FOOD

Introduction, Microbiological Media ,Types of Media ,Preparation of Media ,Enumeration Procedures ,Direct Microscopic Count (DMC) ,Standard Plate Count (SPC) ,Spiral Plate Count ,Dye Reduction Tests ,Most Probable Number (MPN) Method ,Pure Culture Method ,Microscopic Examination of the Bacterial Culture ,Simple Staining, Negative Staining, Gram Staining , Endo spore Staining ,

UNIT 6 SCREENING AND ENUMERATION OF SPOILAGE MICRO-ORGANISMS IN FOOD

Introduction ,Detection and Enumeration of Spoilage Micro-organisms,Psychrotrophic Count,Thermoduric Count ,Lipolytic Count ,Pectinolytic Count ,Halophilic Count,Osmophilic Count, Acidophilic Count,

UNIT 7 DETECTION OF PATHOGENS IN FOODS

Introduction, Detection of Bacterial Pathogens ,Bacillus Cereus, Campylobacter ,Escherichia Ccoliand Coliforms ,Listeria Monocytogenes,SalmonellaSpecies ,Staphylococcus Aureus,,Clostridium Perfringens,Detection of Viral Pathogens ,Methods for Detecting Viruses Extracted from Foods

UNIT 8 RAPID DETECTION TECHNIQUES FOR FOOD MICRO-ORGANISMS

Introduction ,Need for Rapid Detection techniques, Biochemical Kits, Immunological Methods ,Enzyme Linked Immuno sorbent Assay (ELISA) ,Immuno-magnetic Separation (IMS), Genetic Methods ,Nucleic Acid Probes, Polymerase Chain Reaction ,

PAPER –THREE

FOOD LAWS AND STANDARDS

BLOCK-1 INDIAN FOOD REGULATORY REGIME

UNIT 1 PFA ACT AND RULES

Introduction, Enforcement of the Prevention of Food Adulteration(PFA) Act 1954 : Role of Central Government / PFA Cell, Role of State/UT Governments 1.2.3 Role of Local Bodies.

PFA Act Definitions: The Preamble of the Act viz. 1.3.2 Definition, Primary Food (Definition), Functions / Responsibilities of Various Authorities, Central Food Laboratories, Role of Food Inspectors (Section 9/ 10 (Appointment and powers), Section 11 (Procedure to be followed by Food Inspectors), Section 12 (Power of Purchaser), Section 13 Report of Analyst, Section 14 (Issue of Warranty), Section 15 Report of Food

Poisoning),Penalties, Powers of State Governments, Discussion on Amendments to the PFA act and Rules, Short Comings, Harmonization of PFA ACT with Codex

UNIT 2 ESSENTIAL COMMODITIES ACT, 1955

Introduction, The Aim of the Act, The Objectives of the Act, Various Sections of the Essential Commodities Act , Various Control Orders in the Act, Some Common Features of Various Order, Fruit products Order, 1955 (Products Covered Under FPO, Licensing Requirements, Documentations Required, Product Specifications, Specification of Packaging Materials, Labelling Requirements), Meat Food Products Order, 1973(Products Covered Under MFPO, Guidelines for Licensing, Labelling Requirements), Milk and Milk Products Order, 1992(Commodities Covered Under the Order, General Sanitary and Hygienic Conditions for Dairy Establishments, Requirements' for Registration), Edible Oils Packing (Regulation) Order, 1998(Salient Features of the Order), Vegetable Oils Products (Regulation) Order, 1998 (Salient Features of the Order, Eligibility for Grant of Registration) Sugar Control Order(Sugar Control Order, 1966, Salient Features of the Order)

BLOCK-2 GLOBAL SCENARIO

UNIT 3 CODEX ALIMENTARIUS COMMISSION (CAC)

Introduction to CAC and its importance in international trade, Statues of the Codex Alimentarius Commission, Difference between CAC and Codex Alimentarius, Importance of CAC in International Trade, Functions of CAC: Commission, Executive Committee(Codex Secretariat, Codex Subsidiary Bodies, General Subject Committees, Commodity Committees, FAO/WHO Coordinating Committees, Ad hoc Intergovernmental Task Forces, Terms of Reference of each Codex Subsidiary Committees),Functions of Codex Committees: Preparations for Codex meetings, Conduct of Codex Meetings(Responsibilities of Chairperson of the Codex Committee), Standard Development process(8-Step Elaboration Procedure, 5-Step Elaboration Procedure, Understanding Horizontal and Vertical Codex Standards), Domestic Shadow Codex Committees, Codex India, Responsibilities of Domestic Shadow Codex Committees, Structure of Domestic Shadow Codex Committees, Need for harmonizing National Standards with Codex

UNIT 4 OTHER INTERNATIONAL STANDARDS SETTING BODIES (ISO, OIE, IPPC, ETC.)

Role of International Standard Setting Bodies in Food Safety and Quality Standards: ISO, OIE, IPPC, ITC, UNEC, FAO, WHO, Role of Non-Government Organizations (Ngos) in Food Safety and Quality Standards (AOAC, ASTM, ILSI), Role of Developed Countries Standard Setting Bodies in Food Safety And Quality

Standards (USFDA, EU, FSANZ), Role of Indian Standard Setting Bodies in Food Safety and Quality Standards (PFA, FPO, MFPO, MMPO, AGMARK, BIS, Export Promotion Agencies, FSSA)

BLOCK-3 EXPORT AND IMPORT LAWS AND REGULATIONS

UNIT 5 FOREIGN TRADE (DEVELOPMENT AND REGULATION) ACT 1992 AND FOREIGN TRADE POLICY Introduction, Salient Features of Foreign Trade Development and Regulation Act 1992 (FTDR 1992), Foreign Trade Policy(Legal Mandate, Basic Objective of FTP, Strategy to Achieve Objective of FTP), General Provisions Regarding Export/ Import, Pre-requisite of Import / Export, Export Promotion Schemes(Export Promotion Capital Goods (EPCG) Scheme, Duty Exemption and Remission Schemes,100% Export Oriented Unit Scheme (100% EOU), Special Economic Zone (SEZ) Policy, Status Scheme)Regulations of Exports, General Conditions on the Imports into Country

UNIT 6 THE EXPORT (QUALITY CONTROL AND INSPECTION) ACT, 1963

Introduction, Salient Features of the Export (Quality Control and Inspection) Act, 1963: Features of the Council, Powers of the Central Government in regard to Quality Control and Inspection, Machinery for Quality Control and Inspection, Power to make Rules, Act to Over-ride other Enactments., Prior to Liberalization, Present Scenario(Systems for Export Inspection and Certification, In Process Quality Control (IPQC) System, Self Certification (SC) System, Food Safety Management Systems based Certification (FSMSC)), Procedure for Approval and Renewal, Procedure for Surveillance, Residue Monitoring Plans (RMP), Provisions and Requirements for Items Covered Under Mandatory Export Certification(Export Certification System for Fishery Products, Export Certification System for Milk Products, Export Certification System for Egg Products, Certification System for Fresh Poultry Meat and Poultry Meat Products, Honey, Raw Meat (Chilled/ Frozen)), Equivalence/Recognition Agreements.

UNIT 7 EXPORTS RELATED REGULATIONS AND STANDARDS SET BY EXPORT PROMOTION BODIES Introduction, Agricultural and Processed Food Products Export Development Authority (APEDA): Activities, Network of Organization, Marine Product Export Development Authority (MPEDA)(Objective of MPEDA, Role of MPEDA in Indian Aquaculture, Activities of MPEDA, Network of Organisation) Coffee Board (Development Assistance Programme), Spices Board(Mains Functions of Spice Board, Quality Marking, Network of Organization), Tobacco Board (Activities of Tobacco Board),Tea Board of India(Functions of Tea Board, Financial Assistance, Indian Tea Logo on Teas Exported from India, Approval / Monitoring Mechanism for India Tea Logo on Teas, Offices of Tea Board) The Cashew Export Promotion Council of India (CEPC)

UNIT 8 PLANTS AND ANIMAL QUARANTINE

Introduction, History of Plant Quarantine, International Evolution of Regulations, Plant Quarantine Regulations in India, The Destructive Insects and Pests Act 1914 (DIP Act), Plant Quarantine (Regulation of Import into India) Order, 2003 (PQ Order), Implementation of Plant Quarantine, WTO-SPS Regulations, Sanitary and Phytosanitary Measures (SPS), International Plant Protection Convention (IPPC), Roles and Implementation of Plant Quarantine (PQ), Animal Quarantine

BLOCK-4 OTHER LAWS AND STANDARD RELATED TO FOOD

UNIT 9 OTHER LAWS RELATED TO FOOD PRODUCTS

Introduction, Standards of Weights & Measures Act, 1976(Interstate Trade or Commerce in Weights & Measures, Standards of Weights & Measures (Packaged Commodities Rules),1977), The Insecticides Act, 1968 (Use of Insecticides in Public Premises and Food Crops, Expert Committee on Use of Insecticides, Restriction in Use of Insecticides under PFA Act/Rules) consumer Protection Act, 1986 (Consumer Protection under PFA Act, Basis of Complaint under the Act, Establishment of Consumer Protection Councils) Customs Act, 1962(Application of Law Relating to Sea Customs and Powers of Custom Officers, Valuation and Assessment of Customs Duty) The Infant Milk Substitutes, Feeding Bottles & Infant Food (Regulation Of Production, Supply & Distribution) Act, 1992 & Rules1993(Health Care System, Standards of Infant Milk Substitutes, Feeding Bottles or Infant Foods) Environmental (Protection) Act, 1986 (Standards of Emission or Discharge of Environmental Pollutants, Prohibition and Restriction on the Location of Industries, ECOMARK Scheme)The Water (Prevention & Control of Pollution) Act, 1974 (The Central and State Boards for Prevention & Control of Water Pollution, Measures for Control of Water Pollution) The Air (Prevention & Control of Pollution) Act, 1981(Functions of Central & State Boards).

UNIT- 10 VOLUNTARY NATIONAL STANDARDS

Introduction, Bureau of Indian Standards (Bureau of Indian Standards Act, 1986): license under BIS to use ISI Certification Mark, Powers and Functions of BIS, Establishment, Publication and Promotion of Indian Standards, Establishment, Maintenance and Recognition of Laboratories, Food Safety Management Systems Certification Scheme, Applicability of BIS under PFA Act., AGMARK {Agricultural Produce (Grading & Marking) Act, 1937] (Standardization and Grading of Agricultural Commodities, Formulation of Grade Standards, Grading and Certification of Agricultural Commodities, Grading and Certification for Internal Trade, Grading and Certification for Exports, Infrastructure for the Certification Programmes, Role of

Central Agmark Laboratory & Regional Agmark Laboratories, Applicability of Agmark Standards under PFA Act.

UNIT 11 NATIONAL AGENCIES FOR IMPLEMENTATION OF INTERNATIONAL FOOD LAWS & STANDARDS

Introduction, Role of Ministry of Health & Family Welfare/ Directorate General of Health

Services (Codex Contact Point): Codex Alimentarius Commission [CAC], National Codex Contact Point [NCCP], National Codex Committee of India. Agencies involved in implementation of provisions of Agreement on Technical Barriers to Trade: WTO TBT Enquiry Point - Role of Bureau of Indian Standards, Guidance for Stakeholders for Commenting on TBT Notifications. Agencies involved in implementation of provisions of Agreement on SPS Measures, Role of States/Local Bodies: National Food Control Acts/Rules1, Implementation of Food Related Acts. Agencies involved in quality control and preshipment inspection for exports: Role of Export Inspection Council, Role Directorate and Marketing of Inspection, Role of Agricultural and Processed Food Products Export Development Authority of India, Role of Ministry of Environment and Forest: Regulatory Reforms in Bio-technology, Genetic Engineering Approval Committee (GEAC). Role of Department of Agriculture & Cooperation, Ministry of Agriculture in

Implementing Insecticides Act, 1968: Good Agricultural Practices (GAP) in use of Pesticides, Codex Maximum Limits for Pesticides Residues in Food & TBT Agreement

UNIT 12 ACCREDITATION SYSTEMS FOR CONFORMITY ASSESSMENT BODIES

Introduction, Important terms, What is Conformity Assessment?, The Conformity Assessment Framework, Components, Supply Chain in Conformity Assessment, Difference Between Certification & Accreditation, Accreditation, Certification 16.5 Benefits of Accreditation to Developing Countries, Some Organizations Contributing to Accreditation Network, International Accreditation Forum, Inc. (IAF), Quality Council of India (QCI) 16.6.3 National Accreditation Board for Certification Bodies (NABCB), National Accreditation Board for Testing and Calibration Laboratories (NABL), Accreditation Process for Certification Bodies in India, Accreditation Process for Testing & Calibration Laboratories in India, Benefits of Laboratory Accreditation, Process of Accreditation.

PAPER -FOUR

PRINCIPLES OF FOOD SAFETY AND QUALITY MANAGEMENT

BLOCK-1- FOOD SAFETY AND QUALITY MANAGEMENT SYSTEM

Introduction, Hazards to Safe Food(Biological Hazard, Chemical Hazard, Physical Hazard) Contamination and Spoilage, What is Hygiene?(The Food itself, People – Safety of Food, Facilities and Equipments), Sources of Contamination(Primary Production, Purchase, Storage, Production (Preparation and Packaging), Distribution and Delivery, Service) Food Quality, The Food Safety Challenge, Protecting Food from Contamination (Biological Food Safety Hazards, Chemical Food Safety Hazards, Physical Food Safety Hazards), Reduce the Effect of Contamination that does Occur, Role of Food Processing Industry / Sector Introduction to Food Safety.

UNIT 2 FOOD SAFETY SYSTEM

Introduction, Changes in the Patterns of Food Consumption, the Increased Risks of Food Borne Infection, Inadequacy of the Existing Methods to Control the Risk, Need for Food Safety Management Systems, And Emerging Trends in Food Safety: Food Safety Legislation, Customer Audits of Food and Food Products, Food Safety Management Systems

UNIT 3 TOTAL QUALITY MANAGEMENT

Introduction, Why Quality Management?, Question of Survival in an Intense Competitive Environment, Increasing Customer Consciousness, Need for Earning Profit instead of Making Profit, Organizational Issues Pointing to the need to Focus on TQ, Basic Tenets of TQM, Benefits of TQM, Understanding Some Basic Concepts, Definition of “Quality”, Definition of “Product”, Dimensions of Quality, Facets of Quality, Concept of a Process and its Networking, Stakeholders and their Expectations, Quality Control and Quality Assurance, Standardisation, Need for Safety and Health in Industry, The Approach Towards Safety, Safety Management, Risk Assessment through Hazard Identification and Job Safety Analysis, Selection of Task, Breaking Down the Task into Various Steps, Assessment and Elimination of Risks, Statistical Quality Control, The Six Sigma Principle, The Steps to Six Sigma, Beyond TQM, General Occupational Health Problems, Public Health (General), Cause of Health Hazards (Particular to Industry), Control of Health Risks, Maintaining of Healthy Environment, Substance Abuse Prevention (Screening for Alcohol and Drugs), Why is the PPE needed?, Safety and Health Management System, Case Studies, Description of the Accident (Case Study 1)

UNIT 4 PROJECT MANAGEMENT

Introduction, The Three Phases of Project Management, The 7-S of Project Management, The Project as a Conversion Process, The Relationship between Project Management and Line Management, The Role of Strategy in Project Management, Time Planning – Tools and Techniques, Project Structures – Teams and Organisation, The Role of Teams, Control Systems, Control of Major Constraints – Cost and Time, Managing and Controlling Suppliers and Contractors, Project Completion and Handover

BLOCK 2 RISK ANALYSES

UNIT 5 INTRODUCTION TO RISK ANALYSIS

Introduction, Changing International Environment, Increasing Demand for "Safe and Wholesome Food", Risk Analysis Definitions Related to Food Safety, Risk Analysis(Structure of Risk Analysis, Carrying Out Risk Analysis, Risk Analysis at International and National Levels), Challenges and Benefits in the Application of Risk Analysis.

UNIT 6 RISK MANAGEMENT

Introduction, What is Risk Management?, Perspectives on Risk, Definitions of Key Risk Management Terms, General Principles of Food Safety Risk Management, A General Risk Management Framework, Preliminary Risk Management Activities, Selection of Risk Management Options, Implementation of Risk Management Decisions, Monitoring and Review, Role of Food Chain Professionals in Risk Management, Self-monitoring and Company Laboratory Accreditation, Guides to Good Hygiene Practices 6.5.3 The Development of Company Certification, Product Standardization, Contribution to Product Traceability

UNIT 7 RISK ASSESSMENT

Introduction, Risk Assessment and the WTO SPS Agreement, Relative Positions of Risk Assessment and Risk Management 7.2 Definitions Related to Risk Assessment, Principles of Food Safety Risk Assessment, Scientific Approaches for Assessing Risks, Risk Assessment, Use of Ranking Tools, Epidemiology, Combination of Approaches, Responsibilities of Risk Managers in Commissioning and Guiding a Risk Assessment(Forming the Risk Assessment Team, Specification of Purpose and Scope, Questions to be Addressed by Risk Assessors, Specification of Form of the Outputs, Time and Resources) General Criteria of Risk Assessment(Objectivity and Transparency, Functional Separation of Risk Assessment and Risk Management, Structured Process, Basis in Science, Dealing with Uncertainty and Variability, Peer Review) Risk Assessment Methodology(Basic Components of a Risk Assessment, Qualitative or Quantitative?), Risk Assessment for Chemical Hazards(Hazard Identification, Hazard Characterization, Exposure

Assessment, Risk Characterization, Application of Toxicological Guidance Values), Risk Assessment for Biological Hazards (Hazard Identification, Hazard Characterization, Exposure Assessment, Risk Characterization), Biotechnology Risk Assessment, Sensitivity Analysis, Validation, Establishment of 'Targets' in the Food Chain as Regulatory Standards.

UNIT 8 RISK COMMUNICATION

Introduction, Understanding Risk Communication, The Goals of Risk Communication, Key Communication Stages during Food Safety Risk Analysis: Preliminary Risk Management Activities, Identifying and Selecting Risk Management Options, Implementation, Monitoring and Review. Roles and Responsibilities for Risk Communication(International Organizations, Governments, Industry, Consumers and Consumer Organizations, Academia and Research Institutions, Media), Elements of Effective Risk Communication, Principles of Risk Communication(Know the Audience, Involve the Scientific Experts, Establish Expertise in Communication, Be a Credible Source of Information, Share Responsibility, Difference between Science and Value Judgement, Assure Transparency, Put the Risk in Perspective) Some Practical Aspects of Risk Communication(Goals of Communication, Communication Strategies, Identifying 'Stakeholders', Methods and Media for Communication)

BLOCK -3 HACCP

UNIT 9 -HISTORY, BACKGROUND AND STRUCTURE OF HACCP

Introduction, Food Chain Steps, Food Hazards, Biological Hazards (Bacteria, Parasites, Viruses) Chemical Hazards, Physical Hazards, History of HACCP, Benefits and Barriers in Implementing HACCP, HACCP Principles, Process of HACCP Certification

UNIT 10 HACCP PREREQUISITES AND GOOD HYGIENIC PRACTICES

Introduction, Environmental Hygiene(Hygienic Production of Food, Handling, Storage and Transportation, Cleaning, Maintenance and Personnel Hygiene at Primary Production), Design and Facilities in the Establishment(Location, Equipment), Premises and Rooms(Design and Layout, Internal Structures and Fittings, Temporary/ Mobile Premises and Vending Machines), Equipments(General, Food Control and Monitoring Equipments, Containers for Waste and Inedible Substances), Utilities(Water Supply, Drainage and Waste Disposal, Cleaning, Personnel Hygiene Facilities and Toilets, Temperature Control, Lighting, Storage, Control of Operations, Transportation and Receiving, Handling and Storage, Transport and Shipping, Management and Supervision, Documentation and Records, Personnel Health and Hygiene,

health Status, Personal Hygiene, Visitors and Non-company Personnel, Pest Control, Preventing Access, Pest Control Programme, Pest Control Personnel, Pest Control Chemicals, Monitoring Effectiveness, Training, Food Safety Awareness, Roles and Responsibilities, Traceability and Recall Procedures

UNIT11 PRINCIPLES AND IMPLEMENTATION OF HACCP

Introduction, Identification of Hazards and Control Measures, Assemble HACCP Team, Describe Product, Construct Flow Diagram, Determination of Significant Hazards, Determination of Acceptable Levels, Consideration of Control Measure, Determination of Critical Control Points, Establishing the Critical Limits, Establishment of a Monitoring System, Establish Corrective Actions, Establish Verification Procedures, Establish Documentation and Record Keeping, Validation, General Errors in HACCP Plans, Quantitative Approach in HACCP(Food Safety Objectives, Numerical Calculations in HACCP, Validation of Numerical Values, HACCP and Microbiological Risk Assessment (MRA)),When to Implement HACCP Plan

UNIT 12 CASE STUDIES ON HACCP

Introduction, Guava Juice Production Plant(Incoming Materials, Processing, Packaging, Storage/ Shipping) Hazard Analysis Worksheet(Hazard Identification and Evaluation, and Justification for Decisions, Control Measures) CCP Decision Tree, Determination of Critical Limits(Critical Limits, information on Critical Limits, Establishing Operating Limits), Monitoring(Design of a Monitoring System, Monitoring Frequency, Who will Monitor?), Corrective Actions(Components of Corrective Actions, Corrective Action Records) Verification Procedures(Elements of Verification, Validation, Verification of CCPs, CCP Record Review), Record Keeping Procedures(Required Records, Monitoring Records, Verification Records).

BLOCK-4 OTHER FOOD SAFETY PRACTICES

UNIT 13 GOOD AGRICULTURE PRACTICES, GOOD ANIMAL HUSBANDRY PRACTICES AND GOOD MANUFACTURING PRACTICES

Introduction, Good Agricultural Practices, Good Animal Husbandry Practices, Good Manufacturing Practices, Good Hygiene Practices(Objectives of GHP, Primary Production, Establishment, Design and Facilities, Control of Operation, Establishment, Maintenance and Sanitation, Establishment, Personal Hygiene, Transportation, Product Information and Consumer Awareness, Training).

UNIT -14 -GOOD RETAILPRACTICES, GOOD TRANSPORTPRACTICES, AND NUTRITION LABELLING

Introduction, Good Retail Practices (GRP), Good Transport Practices (GTP),Nutrition Labelling, Traceability Records.

UNIT- 15-TRACEABILITY STUDIES

Introduction, What is Traceability?, Rationale and Objective of Traceability, Traceability and Codex(Evolution of Discussion in the Codex Framework, Components of the Traceability/ Product Tracing Tool), Limitations of Implementing the Traceability/ Product Tracing Tool, Alternatives to the Traceability/ Product Tracing Tool, Recommended Steps for the Application of Traceability/ Product Tracing Tool, India's Experience with Traceability-The Grape Story, The Vision.

PAPER -FIVE

FOOD SAFETY QUALITY AUDITING

UNIT 1 INTRODUCTION TO MANAGEMENT SYSTEMS

Introduction, ISO 9001:2000 Quality Management System-Requirements(Introduction to ISO 9001 1.2.2 ISO 9000), ISO 14001:2004 Environmental Management System-Requirements(Introduction to ISO 14001: 2004, How to Use ISO 14001, Your General Approach, Application, Structure and Interpretation), OHSAS 18001:2007 Occupational Health and Safety Management Systems Requirements(Introduction to OHSAS 18001: 2007, How to Use 18001 OHSAS 18001:2007, PDCA Methodology, Your General Approach), ISO/IEC 27001:2005 Information Technology-Security Techniques- Information Security Management System-Requirements(ISO and IEC, ISO/IEC 27001 vs. BS 7799-2, Introduction to ISO/IEC 27001, The PDCA Model, Your General Approach, The Process Approach.

UNIT 2 AUDITING

Introduction, Clause 1 – Scope of the Standard, Clause 2 – Normative References, Clause 3 – Terms and Definitions, Clause 4 – Principles of Auditing, Clause 5 – Managing an Audit Program(Audit Program Objectives and Extent, Audit Program Responsibilities, Resources and Procedures, Audit Program Resources, Audit Program Procedures, Audit Program Implementation, Audit Program Records, Audit Program Monitoring and Reviewing), Clause 6 – Audit Activities(Initiating the Audit, Conducting Document Review, Conducting on Site Activities, Roles and Responsibilities of Guides and Observers,

Preparing Audit Conclusions, Preparing, Approving and Distributing the Audit Report) Clause 7 – Competence and Evaluation of Auditors(Personal Attributes, Knowledge and Skills).

UNIT 3 STANDARDIZATION AND ACCREDITATION

Introduction, International Accreditation Forum (IAF)(IAF an Organisation, Role of IAF, IAF Membership, IAF Programs, IAF Charter), International Laboratory Accreditation Cooperation (ILAC)(The International Laboratory Accreditation Cooperation (ILAC), ILAC's Role, ILAC Mutual Recognition Arrangement), Quality Council of India (QCI)(Introduction, Main Objectives of the QCI, Structure of QCI), National Accreditation Board for Testing and Calibration Laboratories (NABL)(National Accreditation Board for Testing and Calibration Laboratories, Why do Laboratories get Accreditation?, Benefits of Accreditation, Scope of Accreditation, Procedure for Accreditation), ISO/TS 22003:2007 Food Safety Management System-Requirement for Bodies Providing Audit and Certification of Food Safety Management Systems, The International Organisation for Standardization (ISO) Published ISO/TS

22003:2007, ISO 22000, ISO Guide 65: General Requirements for Bodies Operating Product Certification Systems (Certification of a Product, The Certification System), ISO/IEC 17020:1998 General Criteria for the Operation of Various Types of Bodies Performing Inspections, ISO/IEC 17021:2006 – Conformity Assessment-Requirements for Bodies Providing Audit and Certification of Management Systems, ISO 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories

BLOCK-2 UNIT 4 ISO 9001:2000 - AN OVERVIEW

Introduction, ISO 9000 (History of ISO 9000, Quality Management Principles), ISO 9000:2005, Quality Management Systems: Fundamentals and Vocabulary, Terminology of Quality Management Systems, ISO 9001:2000, Quality Management Systems: Requirements (Steps for Implementing Quality Management Systems, Benefits), ISO 9004:2000, Quality Management Systems: Guidelines for Performance Improvements (Relationship with ISO 9001:2000, Self-assessment Model.

UNIT 5 ISO 9001:2000 – STRUCTURE

Introduction, Documentation Structure of ISO 9001: 2000(Quality Manual, Mandatory Procedures, Standard Operating Procedures (SOPs), Process Definition Documents, Work Instructions, Miscellaneous Documents, Formats and Records), ISO 9001:2000 Clauses.

UNIT 6 CLAUSE WISE INTERPRETATION OF ISO 9001:2000

Introduction, Clause-wise Explanation of ISO 9001:2000, Clause 1: Scope, Clause 2: Normative Reference, Clause 3: Terms and Definitions, Clause 4: Quality Management System, Clause 5: Management Responsibility, Clause 6: Resource Management, Clause 7: Product Realization, Clause 8: Measurement, Analysis and Improvement

UNIT 7 ISO 9001:2000 - CASE STUDIES

Introduction, Enterprise Sector-wise Case Studies, Engineering Job Work Organisation, Software Development Organisation

UNIT 8 ISO 22000:2005 - AN OVERVIEW

Introduction, Key Features of ISO 22000:2005, What Does ISO 22000 Bring to the HACCP Method?, System Components, Communication between Participants in the Food Industry, ISO 22000: A Passport for Exporting?, Why do Companies Commit themselves to an ISO 22000 Approach?, Who Should Use ISO 22000:2005?, ISO 22000 can be used by, Why to Use ISO 22000:2005?, ISO 22000 and HACCP, Codex Alimentarius, Commodity Standards, HACCP,ISO Family, ISO 22000 is Fully Compatible with ISO 9001:2000, Key Elements and Benefits of ISO 22000

UNIT 9 ISO 22000:2005 – STRUCTURE

Introduction, Economic Loss due to Food Borne Illness, ISO 22000: 2005 Clauses, FSMS Documentation Structure(Food Safety Manual, Mandatory Procedures, Standard Operating Procedures (SOP)/ Work Instructions, HACCP Pre-steps Related Documents, HACCP Principles Related Documents, Miscellaneous Documents, Formats and Records), Food Safety Team Structure.

UNIT 10 CLAUSE-WISE INTERPRETATION OF ISO 22000: 2005

Introduction, Clause-wise Explanation of the Standard, Clause 1: Scope, Clause 2: Normative References, Clause 3: Terms and Definitions, Clause 4: Food Safety Management System, Clause 5: Management

Responsibility, Clause 6: Resource Management, Clause 7: Planning and Realization of Safe Products, Clause 8: Validation, Verification and Improvement of the FSMS

UNIT 11 ISO 22000:2005-CASE STUDIES

Introduction, Implementation in a Typical Food Industry.

PAPER SIX

INSTITITIONAL MANAGEMENT IN DIETETICS

UNIT1 PLANNING A FOOD SERVICE UNIT

Introduction, The Management Process, Planning: Steps in Planning, Types of Plan, Preparing a Planning Guide or Prospectus, Registration of the Unit, Application for a Licence, Rules Regarding Grading of Hotels and Restaurants, Systems Approach in Food Service.

UNIT 2 SETTING UP FOOD SERVICE UNIT

Introduction, Layout and Design: Definition, Factors Influencing Layout Design, Planning Team, Planning of a Layout: Various Phases, Gathering Information or Development of a Prospectus, Determining Work Centres, Equipment, Developing Overall Plan, Architectural Features, Evaluation of Plans, Energy and Time Management, Financial Status Analysis.

UNIT 3 ENTREPRENEURSHIP AND FOOD SERVICE MANAGEMENT

Introduction, A Conceptual Perspective of Entrepreneurship, Defining Entrepreneurship,Characteristics of Successful Entrepreneurs Creativity, Innovation and Entrepreneurship:- The Creative Process, The Process of Innovation Business Requirements for Food Products, What an Entrepreneur Needs to Consider, Government Requirements, Marketing, Developing the Business Plan, Determine the Resources Needed, Managing the Business Entrepreneurship Development and Training, Approaches to Entrepreneurship Development, The Selective Methods.

UNIT 4 FOOD MANAGEMENT: MENU PLANNING - FOCAL POINT OF ALL ACTIVITIES IN FOOD SERVICE ESTABLISHMENTS

Introduction, The Importance of Menu and Menu Planning in Food Service Organization, Definition and Functions of a Menu, The Need for Menu Planning, Knowledge and Skills Required for Planning Menu, The Types of Menu and its Applications, Types of Menus, Uses of Menus, Steps in Menu Planning and its Evaluation, Construction of Menu,Characteristics of a Good Menu, Display a Menu, Evaluation of Menu.

UNIT 5 FOOD MANAGEMENT STORAGE AND PURCHASE

Introduction, Purchasing: A Food Management Activity, The Market and the Buyer, The Buyer, The Vendor or the Supplier, Mode of Purchasing, Centralized Purchasing, Group Purchasing, Methods of Purchasing, Informal or Open Market Buying, Formal or Competitive Bid Buying, Other Types of Purchasing Methods, Identifying Needs and Amounts to Buy, Minimum Stock Level, Maximum Stock Level.

UNIT 6 FOOD MANAGEMENT: QUALITY FOOD PRODUCTION - PLANNING AND CONTROL

Introduction, Principles of Food Production, Food Production Systems Management, Menu, Ingredient Control, Production Forecasting, Production Scheduling, Production Control, Use of Standardized Recipes, Developing a Programme for Recipe Standardization, Safeguard in Food Production, Quality Control in Food Preparation and Cooking.

UNIT 7 QUANTITY FOOD PRODUCTION: KITCHEN PRODUCTION

Introduction, General Procedures Used in Institutional and Commercial Food Production, Collecting Ingredients, Selection of Food, Weighing and Measuring, Preliminary Treatment of Food, Food Production to Achieve Consumer Satisfaction, Basic Cookery Process and their Application to Quantity Production, Moist Heat Method, Dry Heat Method, Combination Method, Types of Equipments, Cooking Equipment, Mechanical Processing Equipment, Non-Cooking: Refrigeration Equipment.

UNIT 8 FOOD MANAGEMENT: DELIVERY AND SERVICE STYLES

Introduction, Different Types of Service in Food Service Establishments, Table and Counter Service, Self Service, Tray Service, Types of Service in a Restaurant, Silver Service, Plate Service, Cafeteria Service, Buffet Service, Summary of Service Styles, Specialized Forms of Service, Hospital Tray Service, Airline Tray Service, Rail Service, Home Delivery, Catering and Banquet, Floor/Room Service, Lounge Service.

UNIT 9 FOOD MANAGEMENT: TYPES OF FOOD SERVICE SYSTEMS

Introduction, Introduction to Food Service Systems, Types of Service Systems, Conventional, Commissary, Ready Prepared, Assembly Serve, Distribution and Service in Food Service System, Conventional Food Service System, Commissary Food Service System, Ready Prepared Food Service System.

UNIT 10 PERSONNEL MANAGEMENT: STAFF PLANNING AND MANAGEMENT Introduction, Staff Planning and Management, Approaches to Staff Management, Issues in Planning and Management, Steps in Planning, Staff Scheduling, Employment Process, Determining Staff Requirements, Establishing Policies for Recruitment, Outlining Procedures, Staff Recruitment and Selection, Staff Placement, Documenting Contract.

UNIT 11 ISSUES IN FOOD SAFETY

Introduction, Microbiology and Food Safety, Microorganisms in Foods, Growth of Bacteria and the Factors that Affect the Growth of Microorganisms, Control of Microbial Growth in Foods Food Borne Illness, Types of Food Borne Illnesses, Control of Food Borne Illnesses Modes of Disease Transmission, Routes of Disease Transmission, Source of Contamination Conditions that Could Lead to Food Spoilage, Categorization of Food on the Basis of their Shelf Life or Perish ability and Conditions that could Lead to Food Spoilage.

UNIT 12 ISSUES IN WORKER SAFETY AND SECURITY

Introduction, Personal Hygiene and Sanitary Practices, Health of Staff, Sanitary Practices, Sanitation Training and Education for Food Service Workers, Sanitation Training and Education, Types of Accidents, Precautions to Prevent Accidents, Sanitation Regulations and Standards, Control of Food Quality, Adulteration and Misbranding.

Course outcome: PGDFSQM-01 Food Fundamentals & Chemistry

CO1: Introduction to Food Science: Food Basics, Food from Plant Sources, food from Animal Sources, Other Foods.

CO2: Food Chemistry: Water, Carbohydrates, Proteins and Enzymes, Lipids, Vitamins and Minerals, Food Additives.

CO3: Food Analysis: Sampling Techniques of Food Products, Physical and Chemical Analysis of Foods, Instrumentation in Food Analysis, Sensory Evaluation of Food Products.

CO4: Food Processing and Preservation, Introduction to Food Preservation and Processing, Food Packaging, Waste Management in Food Processing Industry.

Mapping of CO to PO

Course outcome (CO)	Programme outcome (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6	P
CO1	X						
CO2	X		X				
CO3	X	X	X	X		X	
CO4	X	X		X			X

Course outcome: PGDFSQM-02 Food Microbiology

CO1: Fundamentals of Food Microbiology: Introduction to Food Microbiology, Food Contamination and Spoilage, Food Borne Diseases, Beneficial Roles of Micro-Organisms.

CO2: Analytical Techniques in Microbiology, General Techniques of Detection and Enumeration of Micro-organisms in Food, Screening and Enumeration of Spoilage Micro-organisms in Food, Detection of Pathogens in Food, Rapid Detection Technique for Food Micro-organisms.

CO3: Name of Experiment: Introduction to the Basic Microbiology Laboratory Practices, Cleaning and Methods of Sterilization, Cultivation and Sub-culturing of Microbes.

Explain fermentation – its science and technology;

Mapping of CO to PO

Course outcome (CO)	Programme outcome (PO)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1		X		X		X	
CO2		X		X		X	
CO3				X		X	X

Course outcome : PGDFSQM-03 Food Laws and Standards

CO1: Indian Food Regulatory Regime, Prevention of Food Adulteration Act and Rules, Food Safety and Quality Requirements, Food Safety and Standard Act, 2006, Essential Commodities Act, 1955.

CO2: Global Scenario, Codex Alimentations Commission (CAC), WTO Implications, Other International Standard Setting Bodies.

CO3: Export and Import Laws and Regulations, FTDR Act, 1992 and Foreign Trade Policy, Export (Quality Control and Inspection) Act, 1963, Export Regulations and Promotion Bodies, Plant and Animal Quarantine, Customs Act and Import Control Regulations

CO4: Other Laws and Standards Related to Foods, Other Laws Related to Food Products, Voluntary National Standards: BIS and AGMARK, National Agencies for Implementation of International Food Laws and Standards, Food Labelling.

Mapping of CO to PO

Course outcome (CO)	Programme outcome (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO
CO1	X		X	X	X		
CO2			X	X	X		
CO3			X	X	X		
CO4							

Course outcome : PGDFSQM-04 Principles of Food Safety and Quality Management

CO1: Food Safety and Quality Management Systems: Introduction to Food Safety, Food Safety System, Total Quality Management, Project Management

CO2: Risk Analysis, an Introduction to Risk Analysis, Risk Management, Risk Assessment, Risk Communication.

CO3: HACCP: History, Background and Structure of HACCP, HACCP Prerequisites and Good Hygienic Practices, Principles and Implementation of HACCP, Case Studies on HACCP.

CO4: Other Food Safety Practices: Good Agriculture Practices, Good Animal Husbandry Practices and Good Manufacturing Practices, Good Retail Practices, Good Transport Practices and Nutrition Labelling, Traceability Studies.

Mapping of CO to PO

Course outcome (CO)	Programme outcome (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO
CO1	X						
CO2							
CO3	X		X	X			
CO4			X	X			

Course outcome : PGDFSQM-05 Food Safety and Quality Auditing

CO1: Management Systems: Auditing and Accreditation, Introduction to Management Systems, Auditing, Standardization and Accreditation.

CO2: ISO 9001:2000: ISO 9001:2000 - An Overview, ISO 9001:2000 – Structure, Clause wise Interpretation of ISO 9001:2000, ISO 9001:2000 - Case Studies.

CO3: ISO 22000:2005: ISO 22000:2005 - An overview, ISO 22000:2005 – Structure, Clause wise Interpretation of ISO 22000:2005, ISO 22000:2005 - Case Studies.

CO4: Laboratory Quality Management System: An Overview and Requirements of ISO 17025, Requirements Specific to Food Testing Laboratories - Physical and Chemical Parameters, Requirements Specific to Food Testing Laboratories - Biological Parameters, General Topics: Related to Food Testing Laboratories.

CO5: Retailer Standards: BRC Food and BRC/IOP Standards - An Overview, International Food Standard (IFS), SQF 1000 and SQF 2000, Global GAP and India GAP.

Mapping of CO to PO

Course outcome (CO)	Programme outcome (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6	P
CO1			X	X		X	
CO2	X		X	X	X		
CO3		X	X	X	X		X
CO4			X	X			X

Course outcome : PGDFSQM-06 Chemical Analysis and Quality Assurance

CO1: NAME OF EXPERIMENT: Calibration of Glassware, Preparation of Standard Volumetric Solutions, Determination of Moisture in Food Products by Hot Air Oven-Drying Method, Determination of Moisture in Food Products Using Karl Fischer Titration Method.

CO2: Determination of Moisture in Food Products by Dean and Stark Method, Determination of Protein Content in Food Products By Kjeldahl Method, Determination of Crude Fat in Foods by Soxhlet Extraction Method, Determination of Total Fat in Foods by Rose Gottleib Method

CO3: Determination of Volatile Oil in Spices, Determination of Starch in Cereal Grains by Acid Hydrolysis Method, Determination of Starch in Cereal Grains by Glucoamylase Method, Determination of Crude Fibre in Food.

Mapping of CO to PO

Course outcome (CO)	Programme outcome (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6	
CO1			X		X		X
CO2		X	X	X		X	
CO3	X			X			X
CO4	X					X	

Course outcome : PGDFSQM-07 Institutional Management and Dietetics

CO1: Understand the process of planning, organizing and controlling the management of food and other resources in institutions.

CO2: latest advances in nutrition and food science and food challenges in next millennium.

CO3: Food serving methods,importance of food serving presentation.

Mapping of CO to PO

Course outcome (CO)	Programme outcome (PO)						
	PO1	PO2	PO3	PO4	PO5	PO6	
CO1	X		X		X		
CO2	X	X		X	X	X	
CO3		X	X				
CO4							X