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

## Syllabus

**Course-MVP-001: Food Fundamentals and Chemistry (4+0)**

| Block | Block Title | Unit | Unit Title |
|---|---|---|---|
| 1 | Introduction to food science | 1 | Food Basics |
| | | 2 | Food from Plant Sources |
| | | 3 | Foods from Animal Sources |
| | | 4 | Other Foods |
| 2 | Food Chemistry | 5 | Water |
| | | 6 | Carbohydrates |
| | | 7 | Proteins and Enzymes |
| | | 8 | Lipids |
| | | 9 | Vitamins and Minerals |
| | | 10 | Food Additives |
| 3 | Food Analysis | 11 | Sampling Techniques of Food Products |
| | | 12 | Physical and Chemical Analysis of Foods |
| | | 13 | Instrumentation in Food Analysis |
| | | 14 | Sensory Evaluation of Food Products |
| 4 | Food Processing and Preservation | 15 | Introduction to Food Preservation and Processing |
| | | 16 | Food Packaging |
| | | 17 | Waste Management in Food Processing Industry |

**Course-MVPI-001: Food Microbiology (2+2)**

| Block | Block Title | Unit | Unit Title |
|---|---|---|---|
| 1 | Fundamentals of Food Microbiology | 1 | Introduction to Food Microbiology |
| | | 2 | Food Contamination and Spoilage |
| | | 3 | Food Borne Diseases |
| | | 4 | Beneficial Roles of Micro-Organisms |
| 2 | Analytical Techniques in Microbiology | 5 | General Techniques of Detection and Enumeration of Micro-organisms in Food |
| | | 6 | Screening and Enumeration of Spoilage Micro-organisms in Food |
| | | 7 | Detection of Pathogens in Food |
| | | 8 | Rapid Detection Technique for Food Micro-organisms |
| | Practical Manual | 1 | Introduction to the Basic Microbiology Laboratory Practices |
| | | 2 | Cleaning and Methods of Sterilization |
| | | 3 | Cultivation and Sub-culturing of Microbes |
| | | 4 | Staining Techniques |

| | | | |
|---|---|---|---|
| | | 5 | Standard Plate Count Method |
| | | 6 | Direct Microscopic Examination of Foods |
| | | 7 | Enumeration of Fungi (Yeasts and Molds) |
| | | 8 | Assessment of Air using Surface Impingement Method |
| | | 9 | Assessment of Surface Sterilization using Swab and Rinse Method |
| | | 10 | Detection of Coliforms and Indicator Organisms<br>(1) Most Probable Number |
| | | 11 | Detection of Coliforms and Indicator Organisms<br>(2) Confirmed and Completed Tests, Membrane Filter Techniques |
| | | 12 | EXPERIMENT 12<br>Interpretation of Microbiological Data and its Inferences |

**Course-MVP-002: Food Laws and Standards (4+0)**

| Block | Block Title | Unit | Unit Title |
|---|---|---|---|
| 1 | Food Safety and Standard Act, Rules and Regulations | 1 | Food Safety and Standard Act, 2006 |
| | | 2 | Food Safety and Standards Rules and regulations - Standards |
| | | 3 | Food Safety and Standards Rules and regulations, - Procedures |
| | | 4 | Inspection and Audit |
| 2 | Global Scenario | 5 | Codex Alimentarius Commission (CAC) |
| | | 6 | WTO Implications |
| | | 7 | Other International Standard Setting Bodies |
| 3 | Export and Import Laws and Regulations | 8 | Export (Act, |
| | | 9 | Export Regulations and Promotion Bodies |
| | | 10 | Food import and Quarantine aspects |
| 4 | Other Laws and Standards Related to Foods | 11 | International regulatory bodies |
| | | 12 | Other Laws Related to Food Products |
| | | 13 | Voluntary National Standards: BIS and AGMARK |
| | | 14 | National Agencies for Implementation of International Food Laws and Standards |
| | | 15 | Food Labelling |

**Course-MVP-003: Principles of Food Safety and Quality Management (4+0)**

| Block | Block Title | Unit | Unit Title |
|---|---|---|---|
| 1 | Food Safety and Quality Management Systems | 1 | Introduction to Food Safety |
| | | 2 | Food Safety System |
| | | 3 | Total Quality Management |
| | | 4 | Schedule 4 of FSSR |
| 2 | Risk Analysis | 5 | An Introduction to Risk Analysis |
| | | 6 | Risk Management |

| | | | |
|---|---|---|---|
| | | 7 | Risk Assessment |
| | | 8 | Risk Communication |
| 3 | HACCP | 9 | History, Background and Structure of HACCP |
| | | 10 | HACCP Prerequisites and Good Hygienic Practices |
| | | 11 | Principles and Implementation of HACCP |
| | | 12 | Case Studies on HACCP |
| 4 | Other Food Safety Practices | 13 | Good Agriculture Practices, Good Animal Husbandry Practices and Good Manufacturing Practices |
| | | 14 | Good Retail Practices, Good Transport Practices and Nutrition Labelling |
| | | 15 | Traceability Studies |

**Course-MVP-004: Food Safety and Quality Management Systems (4+0)**

| Block | Block Title | Unit | Unit Title |
|---|---|---|---|
| 1 | Management Systems, Auditing and Accreditation | 1 | Introduction to Management Systems |
| | | 2 | Auditing |
| | | 3 | Standardization and Accreditation |
| 2 | Quality Management System | 4 | ISO-9001:2015 - An Overview |
| | | 5 | ISO-9001:2015 – Structure |
| | | 6 | Clause wise Interpretation of ISO 9001:2015 |
| | | 7 | ISO 9001:2015- Case Studies |
| 3 | Food Safety Management Systems | 8 | ISO 22000:2018 - An overview |
| | | 9 | Clause Wise Interpretation of ISO 22000 |
| | | 10 | ISO 22000:2018 - Food Safety Plan |
| | | 11 | ISO 22000:2018 - Case Studies |
| 4 | Laboratory Quality Management System | 12 | An Overview and Requirements of ISO 17025 |
| | | 13 | Requirements Specific to Food Testing Laboratories - Physical and Chemical Parameters |
| | | 14 | Requirements Specific to Food Testing Laboratories - Biological Parameters |
| | | 15 | General Topics: Related to Food Testing Laboratories |
| 5 | Retailer Standards | 16 | BRC Food and BRC/IOP Standards - An Overview |
| | | 17 | International Food Standard (IFS) |
| | | 18 | SQF 1000 and SQF 2000 |
| | | 19 | Global GAP and India GAP |

**Course-MVPL-001: Food Safety and Quality Auditing (0+4)**

| | | | |
|---|---|---|---|
| | Practical Manual | 1 | Visit to a nearby Food Establishment |
| | | 2 | GHP and GMP in a Food Factory<br>a) Identifying the Key Focus Areas for GHP and GMP<br>b) Identifying Gaps in its Implementation<br>c) Closure Plans for Identified Gaps in a Food Factory/ Food Outlet |
| | | 3 | Developing the Process Flow for the Food Establishment Including all |

| | | | |
|---|---|---|---|
| | | | the Inputs, Outputs and Interim Loops |
| | | 4 | Development of Methodology (Decisions Trees) as per Clause 7.4.4 of ISO 22000 for a Food Establishment |
| | | 5 | Developing FSMS (Module 1)<br>a) Data Collection and Hazard Identification (Physical, Chemical and Biological)<br>b) Hazard Analysis (Using FMEA Technique for Risk Assessment) |
| | | 6 | Developing FSMS (Module 2)<br>a) Development of OPRP (Operational Pre-requisite Programme) and Development of HACCP Plan (Critical Limits including Rationale for Limits), Monitoring Procedure, Correction and Corrective Measures)<br>b) Managing Unsafe Product |
| | | 7 | Developing FSMS (Module 3)<br>a) Verification and Validation of Control Measures (OPRP and HACCP Plan) as per Codex Guidelines on Validation<br>b) Emergency Situation, Preparedness and Response Plan<br>c) Communication (External and Internal) |
| | | 8 | Developing FSMS (Module 4): Traceability System as a Tool for, Recall/ Withdrawal (ISO 22005: 2007) |
| | | 9 | Application of ISO 9001 Model<br>a) Understanding Process Approach<br>b) Defining Quality Policy and Objectives<br>c) Correction, Corrective Action and Preventive Action<br>d) Continual Improvement |
| | | 10 | Food Laws (Module 1)<br>Identification of Legal Requirements for following Food Groups/Products/Standards: a) Fruits and Vegetable Products b) Dairy products c) Meat and Meat Products d) Cereal/Pulses/Oil Seeds Products e) Fish and Sea Foods f) Ready to Eat Foods |
| | | 11 | Food Laws (Module 2)<br>Hygienic Requirements for Manufacturing Premises as Prescribed by Law |
| | | 12 | Food Laws (Module 3)<br>Design a Label for any Food Product |
| | | 13 | Matrix Preparation to Find Correspondence between ISO 22000, HACCP Series and BRC and any other Related Standard (Food Retail Management- Basic Requirements) |
| | | 14 | Understanding ISO 17025 Requirements for 9001 and Clause 8.3 in ISO 22000:2005 |
| | | 15 | Audit Planning<br>a) Role and Responsibilities of Auditors and Lead Auditors and Pre-audit Information Required to Plan the Audit (Module 1)<br>b) Preparation of an On-site Audit Plan that is Appropriate to the Audit Scope (Stage 1 and Stage 2) (ISO:22003 and 17021) (Module 2) |
| | | 16 | Produce an Audit Checklist Including Salient Features of ISO 9001 and FSMS 22000 (Module 3) |

| | | | |
|---|---|---|---|
| | | 17 | Document Review as per the Case Study (Module 4) |
| | | 18 | Auditing (Module 5)<br>a) Conducting the Opening Meeting and Closing Meeting (as per ISO: 19011)<br>b) Establishing Qualification Criteria for Auditors and Lead Auditors (ISO 17021 and ISO 22003 for a Food Industry) |
| | | 19 | Mock Audit Exercise to Develop Interpersonal Skills Information Gathering Techniques and Exercising Objectivity in the Review of Evidences Collected (Module 6) |
| | | 20 | Post Audit Activities (Module 7)<br>a) Report Writing, including Writing Valid, Factual and Value adding Non-conformity Report<br>b) Proposals for Corrective Action and Follow Up |

**Course-MVPL-002: Chemical Analysis and Quality Assurance (0+4)**

| | | | |
|---|---|---|---|
| | Practical Manual | 1 | Calibration of Glassware |
| | | 2 | Preparation of Standard Volumetric Solutions |
| | | 3 | Determination of Moisture in Food Products by Hot Air Oven-drying Method |
| | | 4 | Determination of Moisture in Food Products Using Karl Fischer Titration Method |
| | | 5 | Determination of Moisture in Food Products by Dean and Stark Method |
| | | 6 | Determination of Protein Content in Food Products by Kjeldahl Method |
| | | 7 | Determination of Crude Fat in Foods by Soxhlet Extraction Method |
| | | 8 | Determination of Total Fat in Foods by Rose Gottleib Method |
| | | 9 | Determination of Volatile Oil in Spices |
| | | 10 | Determination of Starch in Cereal Grains by Acid Hydrolysis Method |
| | | 11 | Determination of Starch in Cereal Grains by Glucoamylase Method |
| | | 12 | Determination of Crude Fibre in Food Sample |
| | | 13 | Determination of Total Ash Content in Food Products |
| | | 14 | Determination of Acid Insoluble Ash in Food Products |
| | | 15 | Determination of pH of Food Products by Using pH Meter |
| | | 16 | Determination of Free Fatty Acids and Acid Value in Oils and Fats |
| | | 17 | Determination of Unsaponifiable Matter in Oils and Fats |
| | | 18 | Determination of Melting Point or Solidification Point of Oils and Fats |
| | | 19 | Determination of Refractive Index of Oils and Fats |
| | | 20 | Determination of Specific Gravity of Oils and Fats |
| | | 21 | Determination of Titre Value of Oils and Fats |
| | | 22 | Determination of Colour of Oils and Fats by Lovibond Tintometer |
| | | 23 | Determination of Iodine Value in Oils and Fats |
| | | 24 | Determination of Saponification Value in Oils and Fats |
| | | 25 | Determination of Acetyl Value and Hydroxyl Value in Oils and Fats |
| | | 26 | Determination of Allyl Isothiocyanate in Mustard Oil |
| | | 27 | Determination of Reichert Meissl (RM) Value and Polenske Value (PV) in Oils and Fats |

| | | | |
|---|---|---|---|
| | | 28 | Determination of Peroxide Value of Oils and Fats |
| | | 29 | Determination of Sodium Chloride Content in Butter |
| | | 30 | Determination of Gluten Content in Wheat Flour |
| | | 31 | Determination of Sorbic Acid in Food Products |
| | | 32 | Determination of Copper, Zinc, Lead and Cadmium in Food Products by Atomic Absorption Spectroscopy |
| | | 33 | Determination of Cholesterol Content in Ghee by GC |
| | | 34 | Determination of Vitamin A Content in Ghee by HPLC |
| | | 35 | Sensory Evaluation Laboratory |
| | | 36 | Selection of Sensory Panelists |
| | | 37 | Sensory Evaluation of Food Products–Hedonic Rating Test |
| | | 38 | Judging of Milk |

**Course-MVPP-003: Project Work-1**

**List of Suggestive Topics**

1. Study on effective implementation of correction, corrective action and preventive actions as perQMS in an organization.
2. Study on implementation of process approach as required by QMS in a organization.
3. Study of GHP of street food hawkers (Minimum 4 hawkers in one location) and report therecommendations for implementation.
4. Study of GMP in different food industries (organized and unorganized) in different food groups.
5. Development of Training Modules for workers on GMP & GHP.
6. Development of Training Modules for middle management : Internal Audit and concept andImplementation of HACCP.
7. Study on compliance to legal and customer requirements related to food safety and hygiene ina Food establishment.
8. Study on appropriate CCP identification for a food establishment as required by ISO 22000clause 7.4.4.
9. Study on CCP Monitoring, corrective actions and verifications in a food organization and proposeimprovement.
10. Food Safety and Standards Act: Study of existing food laws versus Food Safety and StandardsAct 2006.
11. Study on different emergency situations affecting food safety in a food establishment and proposemitigation plan.
12. Study on Internal communication in an organization for ensuring compliance to 22000 clause 5.6.
13. Study on External communication in an organization for ensuring compliance to 22000 clause 5.6.
14. Study on effective cleaning of equipment/machinery (food contact surfaces including food gloves)

in a food establishment.

15. Study on hygienic practices at raw material suppliers' premises and recommendations forimprovement.
16. Study on suitability of packaging material at various stages of processing (raw, intermediate andfinished product) as per prescribed standards.
17. Study on compliance to labeling requirements for domestic and imported food items (minimumfour different category of products).
18. Study on repeatability and reproducibility of testing methods and results in an organization.
19. Designing an ideal plant layout for a food establishment related to food safety.
20. Study on calibration techniques of instruments in food industry, food laboratories and CCPmonitoring.
21. Study on Waste (liquid and solid) Management in a food establishment.
22. Study on Pest Management in a food establishment.
23. Study on existing versus idealistic process for identification, Traceability and withdrawal (recall)as per ISO 22000 and ISO 22005.
24. Study on method adopted for finalizing/establishing shelf life of a product (against declared/claim).
25. Study on allergens, intolerants *(e.g Lactose)* and their control in a food products.