

Department of Food Processing and Packaging  
Revised Syllabus of II Year Diploma Program (UG)

Title of Program: Food Analysis and Quality Assurance

Syllabus Structure (UG)

Year	Semester	Course No.	Course Code	Contact Hours	Credits (1Credit=15 H)	Total Marks	
2	III	CT III	DFPT 303	30	2	75	
		CL III	DFPL303	60	2	75	
	IV	CT IV	DFPT 404	30	2	75	
		CL IV	DFPL404	60	2	75	
	Annual	CP II	DFPP202	30	1	50	
	Industrial and or Incubation and Research and or Field Training				30	1	-
	<b>Total</b>				<b>240</b>	<b>10</b>	<b>350</b>

Semester III

**D FPT 303: MICROBIAL SAFETY OF FOODS**  
(Contact Hrs: 30 Credits: 2)

**Learning Objectives:**

Students will be able to

1. Know the Importance and significance of microorganisms in food safety.
2. Know the different methods used for determination of microbial count.

**Unit I:**

(15)

Importance and significance of microorganisms in food safety, Intrinsic and extrinsic factors affecting the growth of microorganisms in food, Indicator organisms  
Microbiological standards –Their significance and interpretation.

**Unit II:** (15)

Determination of micro organisms :sampling, sample collection, transport and storage, sample preparation for analysis Microscopic and culture dependent methods- direct microscopic observation, culture enumeration and isolation methods; culture independent techniques – PCR Based, metagenomics.

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Understand the importance and significance of microorganisms in food safety.
2. Understand different methods used for determination of microbial count

**Reference Books:**

1. Food Microbiology by Acharya N G Ranga.
2. Modern Food Microbiology by Jay,J.M.2000. 6<sup>th</sup> Edition Chapman & Hall. New York, N.Y
3. Food Microbiology by Acharya N G Ranga.
4. Modern Food Microbiology by Jay,J.M.2000 6<sup>th</sup> Edition. Chapman & Hall New York, N.Y.
5. Food Microbiology by Adams, M.R., and Moss, M.G, Springer.

**DFPL303: MICROBIAL SAFETY OF FOODS**

**(Contact Hrs: 60 Credits: 02)**

**Learning Objectives:**

Students will be able to

1. Learn the basic food microbiological laboratory practices.
2. Know the isolation techniques of different micro-organisms.
3. Know the enumeration techniques of different micro-organisms.

4. Know the steps involved in Food sampling and analysis

**List of Practical's****(15)**

1. Cleaning of work surfaces, hands, needles, loops etc.
2. Disposal methods for used articles and hazard prevention.
3. Media formulation, preparation and sterilization.
4. Visual examination of growth and description of colony morphology.
5. Enumeration of micro-organisms (turbidity) measure by colorimeter.
6. Enumeration of micro-organism by direct microscopic count.
7. Bacteriological analysis of water by MPN method.
8. Isolation of microorganism by streak plate method.
9. Isolation of microorganism by spread plate method.
10. Isolation of microorganism by pour plate method.
11. Examination of microorganisms from floors, equipments, plants, machineries etc.
12. Collection of food samples – sampling, collection, transport and storage.
13. Food sampling and analysis: A) Sample collection, importance of replicates, sample weighing, slurry preparation, pre-incubations.
14. Food sampling and analysis: B) Serial dilution and plating for standard plate counts, coliforms, yeasts and moulds and pathogens, enumeration, reporting.
15. Microbial examination of canned food sample.

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Understand the basic food microbiological laboratory practices.
2. Perform the isolation techniques of different micro-organisms.
3. Perform the enumeration techniques of different micro-organisms.

4. Understand the steps involved in Food sampling and analysis

**Reference Books:**

1. Manual of Methods of Analysis of Foods, Food Safety and Standards Authority of India. Ministry Of Health and Family Welfare, Government of India, New Delhi-2012
2. Handbook Of Analysis And Quality Control For Fruits And Vegetable Products, Second Edition-S. Ranganna
3. Laboratory Manual of Food Microbiology by Neelima Garg, K. L. Garg, K. G. Mukerji.
4. Practical manual Food Microbiology, H.M. deshpande, G.M. Machewad.

**Semester IV**

**CT-IV: DPFT 404: FOOD MICROBIAL ANALYSIS**

**(Contact Hrs: 30 Credits: 2)**

**Learning Objectives:**

Students will be able to

1. Know the food spoilage and food borne diseases caused by micro-organisms.
2. Know the determination of micro organisms in food.

**Unit I:**

(15)

Food borne diseases: characteristics and incidence- global and Indian scenario Food poisoning and food intoxications of microbial origin Food spoilage: characteristic features Dynamics and significance of spoilage of different groups of foods – Cereal and cereal products, Vegetables and fruits, Meat, poultry and sea foods Milk and milk products Packed and canned foods.

**Unit II:**

(15)

Principles of impedance and conductance, Methods based on bioluminescence measurement (ATP – bioluminescence test) and Spiral plate techniques, Immuno assay techniques – ELISA Use of rapid kits

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Understand the food spoilage and food borne diseases caused by micro-organisms.
2. Understand determine micro-organisms in food.

**Reference Books:**

1. Food Microbiology by Acharya N G Ranga.
2. Modern Food Microbiology by Jay, J. M.2000. 6<sup>th</sup> Edition Chapman & Hall. New York, N.Y
3. Food Microbiology by Acharya N G Ranga.
4. Modern Food Microbiology by Jay, J. M.2000 6<sup>th</sup> Edition. Chapman & Hall New York, N.Y.
5. Food Microbiology by Adams, M.R., and Moss, M.G, Springer.

**DFPL404: FOOD MICROBIAL ANALYSIS**  
**(Contact Hrs: 60 Credits: 02)**

**Learning Objectives:**

Students will be able to

1. Learn the various staining techniques.
2. Know the isolation and Identification of different pathogens.
3. Know the Identification of pathogenic microorganisms by using ELISA method.
4. Learn the investigation of suspected food borne disease outbreak.

**List of Practical's (15)**

1. Gram staining.
2. Monochrome staining.
3. Staining of mold by using lactophenol cotton blue.
4. Isolation and Identification of *E.coli* from food sample.
5. Isolation and Identification of *Staphylococcus* from food sample.
6. Isolation and Identification of *Clostridium* from food sample.
7. Isolation and Identification of *Salmonella* from food sample.
8. Isolation and Identification of *Enterobacter* from food sample.
9. Isolation and Identification of *Listeria* from food sample.
10. Isolation and Identification of *Vibrio cholerae* from food sample.
11. Isolation of Lactic acid bacteria from fermented food.
12. Determination of aerial micro flora.
13. Total plate count of food sample.
14. Detection of pathogenic microorganisms by using ELISA method.
15. Investigation of suspected food borne disease outbreak.

**Learning Outcomes:**

After completion of the unit, Student is able to

1. Understand the various staining techniques.
2. Perform the isolation and Identification of different pathogens.
3. Perform the Identification of pathogenic microorganisms by using ELISA method.
4. Understand the investigation of suspected food borne disease outbreak.

**Reference Books:**

1. Manual of Methods of Analysis of Foods, Food Safety and Standards Authority of India. Ministry Of Health and Family Welfare, Government of India, New Delhi-2012

2. Handbook Of Analysis And Quality Control For Fruits And Vegetable Products, Second Edition-S. Ranganna
3. Laboratory Manual of Food Microbiology by Neelima Garg, K. L. Garg, K. G. Mukerji.
4. Practical manual Food Microbiology, H.M. deshpande, G.M. Machewad.

**CP-II: D \*P202: Project**  
**(Contact Hrs. 60, Credits: 2)**

**Industrial and or Incubation and or Research and or Field Training**  
**(Contact Hrs. 60, Credits: 2)**

BOS Sub-Committee

1. Chairman - Dr.S.S.Wadikar
2. Member - Miss Patil S.M.

Expert Committee

1. Name of Academic Expert – Mr. D.B. Ghorpade
2. Name of Industrial Expert- Mr. S. P. Teli