

16FT202 FOOD MICROBIOLOGY

Hours Per Week :

L	T	P	C
3	-	2	4

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
45	-	30	15	45	-	-	5	5



Course Description and Objectives:

This course deals with basics of food microbiology, preservation and spoilage of various food products. The objective of this course is to enable students to apply identification and enumeration techniques of microbes found in food products.

Course Outcomes:

The student will be able to:

- understand the characteristics, morphology and classification of food borne microorganisms.
- understand microbiology of food products.
- know about pathogens responsible for food spoilage.
- understand the principles involved in food preservation techniques.

SKILLS:

- ✓ *Prepare and sterilize media.*
- ✓ *Identify types of microorganisms present in food products.*
- ✓ *Prepare pure cultures of microbes.*
- ✓ *Isolate microorganisms from the food sample.*

ACTIVITIES:

- Prepare flow charts for production of food products using different microorganisms.

UNIT - 1**L-9**

INTRODUCTION TO MICROBIOLOGY: Classification of microorganisms, Importance of microorganisms in food industry, Moulds: General characteristic, Classification and Identification. Yeasts and Yeast like fungi: General characteristics, Classification, Identification, Yeasts of industrial importance. Bacteria: Morphological, Cultural and Physiological characteristics, Examples of bacteria important in food bacteriology.

UNIT - 2**L-9**

FOOD SPOILAGE: Microbial spoilage of foods, Cause of spoilage, Classification of foods by ease of spoilage, Factors affecting kinds and numbers of microorganisms in food, Factors affecting growth and survival of microorganisms in foods: Intrinsic factors and Extrinsic factors, Chemical changes caused by microorganisms: breakdown of proteins, carbohydrates, fats and other constituents during spoilage, Contamination of Food, Sources of contamination.

UNIT - 3**L-9**

FOOD PRESERVATION: Principles of preservation, Methods of food preservation: High temperature, Low temperature, Drying, Radiation, Chemical preservatives, Bio-preservatives, Hurdle technology, Active packaging, Novel processing technologies.

UNIT - 4**L-9**

MICROBIOLOGY OF MILK AND MILK PRODUCTS: Microbiology of milk and milk products, Contamination, Preservation, Pasteurization, Freezing and Drying, Changes caused by microbes during milk and milk product spoilage: Gas production, Proteolysis, Ropiness, Changes in milk fat, Alkali production, Flavour changes and Colour changes.

MICROBIOLOGY OF FRUITS AND VEGETABLES: Contamination, Preservation of vegetables, Asepsis, Chilling, Freezing, Drying, Preservatives, CA storage, MA storage, Spoilage of fruits and vegetables.

MICROBIOLOGY OF CEREAL AND CEREAL PRODUCTS: Contamination, Preservation, Spoilage of flours and Bread.

UNIT - 5**L-9**

MICROBIOLOGY OF MEAT AND MEAT PRODUCTS: Contamination, Preservation, Spoilage of meat and meat products, Changes during storage, Changes not caused by microorganisms, Changes caused by microorganism. Microbiology of canned foods: Causes of spoilage, Appearance of the unopened container, Types of biological spoilage of canned foods: Flat sour spoilage, TA spoilage, Sulphide spoilage. Types of spoilage of canned foods by Bacteria, Yeasts, Moulds. Spoilage of canned meat.

LABORATORY EXPERIMENTS**LIST OF EXPERIMENTS**

Total hours: 30

1. Introduction to different types of equipment used in food Microbiology Lab.
2. Preparation and sterilization of media.
3. Gram staining and microscopic examination of bacteria.
4. Techniques of pure culture (Pour plate and streak plate).
5. Isolation and Identification of molds from foods.
6. Microbial examination of milk.
7. To perform MBRT for milk.

8. Microbial examination of fruits and vegetable products – Isolation, Identification
9. Microbial examination of Fermented food – Isolation, Identification
10. Determination of effect of various preservatives on the suppression of microbial growth.

TEXT BOOKS:

1. W. C. Frazier and D. C. Westhoff, "Food Microbiology", 4th edition, Tata McGraw Hills Publishing Company Limited, 2004.
2. J. M. Jay, "Modern Food Microbiology", 4th edition, Springer, 2000.

REFERENCE BOOKS:

1. J. Garbutt, "Essentials of Food Microbiology", 2nd edition, Taylor and Francis, 1997.
2. M. J. Pelczar, E. C. S. Chan and N. R. Krieg, "Microbiology", 5th edition, Tata McGraw-Hill Education Pvt. Ltd, 1998.
3. S. J. Forsythe, "Microbiology of Safe Food", 2nd edition, Blackwell Publishing Limited, 2010.