

ANNEXURE-10

**C-10: FOOD AND DAIRY MICROBIOLOGY (THEORY)
SEMESTER –IV HMBCR4102T**

TOTAL HOURS: 52

CREDITS: 4

Module 1

Marks 25

Unit 1 Foods as a substrate for microorganisms

No. of Hours: 5

Intrinsic and extrinsic factors that affect growth and survival of microbes in foods, natural flora and source of contamination of foods in general.

Unit 2 Microbial spoilage of various foods

No. of Hours: 5

Principles, Spoilage of vegetables, fruits, meat, eggs, milk and butter, bread, canned Foods

Unit 3 Principles and methods of food preservation

No. of Hours: 8

Principles, physical methods of food preservation: temperature (low, high, canning, drying), irradiation, hydrostatic pressure, high voltage pulse, microwave processing and aseptic packaging, chemical methods of food preservation: salt, sugar, organic acids, SO₂, nitrite and nitrates, ethylene oxide, antibiotics and bacteriocins

Unit 4 Fermented foods

No. of Hours: 8

Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kumiss, kefir, dahi and cheese, other fermented foods: dosa, sauerkraut, soy sauce and tampeh, Probiotics: Health benefits, types of microorganisms used, probiotic foods available in market.

Module 2

Marks 25

Unit 5 Food borne diseases (causative agents, foods involved, symptoms and preventive measures)

No. of Hours: 14

Food intoxications: *Staphylococcus aureus*, *Clostridium botulinum* and mycotoxins; Food infections: *Bacillus cereus*, *Vibrio parahaemolyticus*, *Escherichia coli*, Salmonellosis, Shigellosis, *Yersinia enterocolitica*, *Listeria monocytogenes* and *Campylobacter jejuni*

Unit 6 Food sanitation and control

No. of Hours: 6

HACCP, Indices of food sanitary quality and sanitizers

Unit 7 Cultural and rapid detection methods of food borne pathogens in foods and introduction

to predictive microbiology.

No. of Hours: 6

Nucleic-acid-based methods, immunological methods, and biosensor-based methods, etc

C-10: FOOD AND DAIRY MICROBIOLOGY (PRACTICAL)

HMBCR4102P

TOTAL HOURS: 39

CREDITS: 2

1. MBRT of milk samples and their standard plate count.
2. Alkaline phosphatase test to check the efficiency of pasteurization of milk.
3. Isolation of any food borne bacteria from food products.
4. Isolation of spoilage microorganisms from spoiled vegetables/fruits.
5. Isolation of spoilage microorganisms from bread.
6. Preparation of Yogurt/Dahi.

SUGGESTED READINGS

1. Adams MR and Moss MO. (1995). Food Microbiology. 4th edition, New Age International (P) Limited Publishers, New Delhi, India.
2. Banwart JM. (1987). Basic Food Microbiology. 1st edition. CBS Publishers and Distributors, Delhi, India.
3. Davidson PM and Brannen AL. (1993). Antimicrobials in Foods. Marcel Dekker, New York.
4. Dillion VM and Board RG. (1996). Natural Antimicrobial Systems and Food Preservation. CAB International, Wallingford, Oxon.
5. Frazier WC and Westhoff DC. (1992). Food Microbiology. 3rd edition. Tata McGraw-Hill

Publishing Company Ltd, New Delhi, India.

6. Gould GW. (1995). *New Methods of Food Preservation*. Blackie Academic and Professional, London.

7. Jay JM, Loessner MJ and Golden DA. (2005). *Modern Food Microbiology*. 7th edition, CBS Publishers and Distributors, Delhi, India.

8. Lund BM, Baird Parker AC, and Gould GW. (2000). *The Microbiological Safety and Quality of*

Foods. Vol. 1-2, ASPEN Publication, Gaithersberg, MD.

9. Tortora GJ, Funke BR, and Case CL. (2008). *Microbiology: An Introduction*. 9th edition. Pearson Education.

