

MB3PG09 - FOOD AND INDUSTRIAL MICROBIOLOGY

Number of Hours / Week: 4

Credits: 4

UNIT I

Incidence and type of microorganisms in food and milk. Contamination and Spoilage of food and milk, Principles of food preservations. Analysis of microbial quality of food and milk. Preservation and preparation of milk products. Fermented food products and beverages.

UNIT II

LAB-- homo and heterolactic fermentations. Single cell protein, Production of edible mushroom, Enzymes in food industry, Nutraceuticals and its applications. Quality assurance: Microbiological quality standards of food. HACCP, ISI. Food poisoning – Food borne diseases, Newer pathogens and emerging foodborne diseases. GMOs, IPR.

UNIT III

Introduction to microbes in industrial processes. Isolation and screening of industrially useful microorganisms, Primary and secondary screening, Strain improvement in industrial microbiology; improvement of characters other than product yield.

UNIT IV

Design of a fermentor, instrumentation and process control; Types of fermentors. Types of fermentations: aerobic and anaerobic; Submerged and Solid State; Importance of media in fermentation, media formulation and modification. Kinetics of growth in batch, continuous, fed-batch fermentation, Fermentation process: Inoculum development- scaling up of process from shake flask to industrial fermentation etc. Storage of cultures for repeated fermentations, Screening, detection and assay of fermentation products (physical, chemical and biological assay). Downstream processing.

UNIT V

Microbes in the production (microbial strains, substrate, flow diagrams, product optimization, and applications) of the following: Industrial alcohol; organic acids, amino acids, alkaloids, enzymes and immobilized enzymes; Vitamins; antibiotics, recombinant products. Microbial transformations of steroids and steriols, nonsteriod compound; Recombinant DNA products- insulin, somatostatin, interferon. Immobilisation of microbial cells

References

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