

17FT007 FOOD MICROBIOLOGY

Hours Per Week :

L	T	P	C
3	-	3	5

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
45	-	45	15	30	-	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:

Upon successful completion of this course student should 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:

- ✓ efficient in preparing sterilize media and pure cultures of microbes
- ✓ able to Identify types of microorganisms present in food products
- ✓ expert in Isolation of microorganisms from the food sample

ACTIVITY

- Detection of different microbes from a given food products obtained from different sites (street foods, supermarket foods, hostel mess food etc).

UNIT – I

Foods as ecological niches, relevant microbial groups, Microbes found in raw materials and foods that are detrimental to quality, Factors that influence the development of microbes in food.

UNIT – II

Newer and rapid methods for qualitative and quantitative assay demonstrating the presence and characterization of microbes, Stress, damage, adaptation, reparation, death.

UNIT – III

Microbial growth in food: intrinsic, extrinsic and implicit factors, Microbial interactions, Inorganic, organic and antibiotic additives. Effects of enzymes and other proteins, Combination systems, Adaptation phenomena and stress phenomena, Effect of injury on growth or survival, Commercial available databases.

UNIT – IV

Microbial behavior against the newer methods of food processing, Adoption and resistance development, Microbes as test organisms, as sensors and as tools for future applications in energy production and food and non food industrial products.

UNIT – V

Modern methods of cell culture: synchronous and co- cell culture, continuous cell culture in liquid and solidmedia, Cell immobilization and applications, Pre and probiotics cultures.

FOOD MICROBIOLOGY AND ENZYMOLOGY LAB

Microbiology:

1. Evaluation of microorganism in raw and processed products by using various techniques
2. Study of factors influencing growth of microorganisms
3. Determination of effects of various preservatives including antibiotics on the suppression of microbial growth
4. Development of cell cultures using various techniques, production of newer microbial metabolites of industrial importance
5. Development of probiotics in lab.
6. Microbiological analysis of raw water quality
7. Isolation of micro organisms in fresh and processed foods.
8. Detection of food borne pathogens using polymerase chain reaction.

Enzymology :

9. Assay of enzymes for activity, specific activity, kinetics, stability (temperature, pH and storage)
10. Extraction and clarification of juices using enzymes
11. Applications of enzymes in baking
12. Starch and protein hydrolysis
13. Meat tenderization
14. Cheese making.
15. Preparation of wine and beer

Note: Out of the above experiments, a minimum of 12 experiments will be conducted in a semeste

TEXTBOOKS:

1. Adams M. 2006. Emerging Food-borne Pathogens. Woodhead Publ.
2. AdamsMR & MossMO. 2000. Food Microbiology. Panima.
3. Easter MC. 2003. Rapid Microbiological Methods in the Pharmaceutical Industry.
4. Harrigan W. 2003. Laboratory Methods in Food Microbiology. University of Reading, UK, Elsevier.

REFERENCEBOOKS:

1. James MJ, Loessner MJ & David A. 2005. Modern Food Microbiology. 7th Ed. Golden Food Science Text Series.
2. PedersonCS. 1979. Microbiology of Food Fermentations. AVI Publ.
3. Roberts R. 2002. Practical Food Microbiology. Blackwell Publ.
4. Rossmore HW. 1995. Handbook of Biocide and Preservative. Blackie
5. Wood JBB. 1999. Microbiology of Fermented Foods. Vols. I, II. Blackwell Academic.
6. Yousef AE. 2002. Food Microbiology: A Laboratory Manual. AVI.