# MANGALORE UNIVERSITY

## Department of Microbiology

## M.Sc. Microbiology

## MBE- 509: Applied Microbiology (Open Elective)

**40h**

**OBJECTIVES**

1. Study on fermented food and dairy products
2. Analysis of food spoilage, Food borne pathogens
3. Probiotics as functional foods
4. Microbes as pollution indicators
5. Mass culturing and Formulation of Biofertilizers
6. Clinically important microbes and control

**COURSE OUTCOME**

CO1: Role of microbes in Food industries, Dairy products, microbes as functional food
CO2: Role of microbes in waste water treatments, biofuel productions,
CO3: Bioleaching, reclamation of mine sites
CO4: Biocontrol agents, Biopesticides, Biofertilizers role in agriculture systems
CO5: Control of infections, role of microbes in Pharmaceutical industries.

**UNIT- I**

Primary sources and growth of microbes in food and dairy products, Spoilage of fruits, vegetables, meat, poultry, fish & sea foods, milk, cheese, canned foods. Microbiology of fermented foods- sausage, vinegar, shoyu, tofu, idli. Microbiology of fermented dairy products- butter milk, sour cream, yoghurt, cheese. Food borne Infections and intoxication, Food and milk borne pathogens- *Bacillus, Brucella, Clostridium, E. coli, Listeria, Salmonella, Staphylococcus, Vibrio, Yersinia.* Microbial foods: Functional foods, probiotics.

**UNIT- II**

Distribution of microorganisms in soil, Factors influencing the soil microflora, Role of microorganisms in soil fertility. Interactions among microorganisms- mutualisms, commensalism, competition, amensalism, parasitism, predation - Interactions between microbes and plants - rhizosphere, phyllosphere, mycorrhizae. Microbial interactions in animals- Rumen microflora, Microbial contribution to food digestion.

**UNIT- III**

Role of microorganisms in waste water treatment, Microbes as pollution indicators, Microbial degradation of herbicides, Biofuel production- biogas, biohydrogen, bioethanol, bioether. Bioleaching, Bioreclamation of mines. Biopesticides Biocontrol

organisms Biofertilizers for sustainable agriculture, Significance of biofertilizers.

**UNIT- IV**

History and basic concept of Medical Microbiology. Infections, Sterilization, and disinfection, Normal microflora of human body. Clinical, microbiological, immunological and molecular diagnosis of microbial diseases caused by *Staphylococci, Bacillus, Clostridium, Corynebacterium, Escherichia, Salmonella, Shigella, Klebsiella, Vibrio, Pseudomonas, Mycobacteria, Spirochaetes, Rickettsia.* Medically important viruses - *Pox, Herpes, Hepatitis, Adeno*, *Picorna, Orthomyxo, Paramyxo, Rhabdo*and HIV virus.Vaccines.

**Note: Each unit is for 10h**