



**MANGALORE UNIVERSITY**  
**DEPARTMENT OF MICROBIOLOGY**  
**MSc Microbiology**

**MBH-402: Bacteriology**

**56h**

**OBJECTIVES**

1. Isolation, identification and preservation of bacterial stains.
2. Screening of bacterial strains from natural source for metabolite production.
3. Mass cultivation of industrially important bacteria.
4. To learn importance of bacteria in Industry, Pharmacy, Agriculture etc.,

**COURSE OUTCOME**

- CO1: Study, diagnosis and treatment of bacterial disease.  
CO2: Employment in diagnostic labs as pathologists  
CO3: Able to maintain bacterial cultures for different applications.  
CO4: Understanding different groups of bacteria.  
CO5: Preservation and Culture collection centre

**Unit I**

Morphology and ultrastructure of bacteria-An overview of bacterial size, shape and arrangement: Bacterial cell wall, Plasma membrane, Cytoplasmic matrix; Ribosomes, Flagella and pili, Bacterial Motility, Intracytoplasmic inclusions: nucleoid, plasmids, transposons, gas vacuoles, cellulosomes, carboxysomes, magnetosomes. Endospore and exospores.

**Unit II**

Characteristics and Salient features of major groups of microbes: Taxonomy of bacteria – Bergy's Manual of Systematic Bacteriology – characteristics of major groups of bacteria. a) Actinomycetes – general characteristics, classification and economic importance. b) Cyanobacteria - general characteristics, classification, ultra- structure, reproduction and economic importance. c) Mycoplasma– general characteristics and examples, growth and multiplication and their significance. d) Archaeobacteria – general characteristics and classification.

**Unit III**

Nutrition and Cultivation- Micro and macro nutrients, growth factors. Culture media: Classification: broth, solid and semisolid media. Simple, complex and special media. Growth: Growth kinetics, generation time, growth curve, factors affecting growth. Aerobic, anaerobic, batch, continuous and synchronous cultures. Mechanism of cell cycle and binary fission. Preparation of bacterial stains: simple staining (positive and negative), differential staining (Gram's staining and acid-fast staining), structural staining (Capsule, flagella and endospore) and nuclear staining.

#### Unit IV

Importance of bacteria- A brief account of economic importance of bacteria in Brewing industry- and Pharmaceuticle- Antibiotics, Vaccines & hormones. Agriculture as Biofertilizers-*Rhizobium*, *Azospirillum* and Plant growth promoting bacteria (PGPR). Biopesticides-*Bacillus thurengiensis*. Environment- Bioremediation and bioleaching.

**Note: Each unit is for 14h**

