

MANGALORE UNIVERSITY
DEPARTMENT OF MICROBIOLOGY
M.Sc. MICROBIOLOGY

MBE- 510: Techniques in Microbiology

40h

OBJECTIVES

1. Study on microbes, isolation and characterization
2. Culture preservation and maintenance
3. Microbial analysis by microscopy techniques, staining methods
4. Biochemical characterization of microbes by using the principles of Spectroscopy, centrifugation chromatography and electrophoretic procedures.

COURSE OUTCOME

- CO1: Isolation techniques in microbiology
- CO2: Maintenance and preservation of pure cultures
- CO3: Importance of culture collection centers
- CO4: Microscopy techniques, Compound microscopy and advances in microscopy: Electron Microscopy
- CO5: Understanding on centrifugation types, Spectrophotometers, Chromatography, Electrophoresis techniques.

Unit-I

Isolation techniques of microorganisms: Isolation of pure cultures; dilution, spread plate, streak plate, pour plate, micromanipulator method, colony morphology and other characteristics of cultures. Maintenance and preservation of pure cultures, culture collection center-national and international. Direct microscopic count, standard plate count, membrane filtration.

Unit II

Microscopy- Principles and Applications of Bright field and Dark field Microscopy. Fluorescent Microscopy, Phase contrast Microscopy, Confocal Microscopy. Electron Microscope-Principles and Applications of Transmission Electron Microscope, Scanning Electron Microscope, Sample preparation for Electron Microscopy.

Unit III

Centrifugation- Basic principles of sedimentation, Types of centrifugation and their Applications, Rotors, Ultracentrifugation. Principle and applications of spectrophotometer- UV/visible, fluorescence. Electrophoresis, SDS-PAGE, Isoelectric focusing, 2D gel Electrophoresis, PFGE. Principles and applications of Chromatography.

Note: Unit I – 14h, Unit II and III – 13h