### Unit 1: History of Microbiology
- Discovery of Microorganisms, Spontaneous generation versus Biogenesis.
- Fermentation, Germ theory of disease, Laboratory techniques and pure cultures, Immunity
- **Widening horizons:**
  - Medical microbiology, Agricultural and Industrial microbiology, Molecular biology

### Unit 2: Morphology and Staining
- Morphology of bacteria, Basic structure of Bacterial cell
- **Stains and staining:**
  - Chemistry of dyes and stains, types of dyes, Principles of staining technique in Bacteria, Theory of staining, Steps in staining process, Role of intensifier and mordents, Role of decolorizer.
  - **Types of staining:**
    - Simple staining, Negative staining, Differential staining (Gram staining and acid fast staining), Supra vital and Intra vital staining

### Unit 3: Ultra structure of Bacterial cell:
- **Structure external to the cell:**
  - Flagella (Structure and function), Pili, Capsules, Sheaths, Prosthecae and stalks.
  - Cell wall structure and chemical composition.
- **Structure internal to the cell wall:**
  - Cytoplasmic membrane, Protoplasts and spheroplasts, Membranous intrusions and Intracellular membrane systems. The cytoplasm. Cytoplasmic inclusions and vacuoles. Nuclear material
  - Spores and Cysts - structure.

### Unit 4: Microscopic examination of microorganisms
- Microscopes and Microscopy. Bright field microscopy. Dark field microscopy
- Fluorescence microscopy, Phase contrast microscopy, Electron microscopy - TEM & SEM, Limitations of electron microscopy

**Basic Text & Reference Books:**
- Microbiology - Pelczar, Chan and Krieg, 5th Ed.
- Elementary Microbiology - H. A. Modi