I SEMESTER

MBH 401: BIOANALYTICAL TECHNIQUES IN MICROBIOLOGY 52 HRS

UNIT-I (13hr)

Historical developments in Microbiology, Inventions/contributions of Louis Pasteur, Robert Koch,Edward, Jenner, Antony van Luevenhoek….., Types of Microscopes and advantages, Components of microscopes, Compound microscope, Phase Contrast, Fluorescent Microscope, Confocal, Electron Microscopy – Principle, Techniques and applications of Transmission Electron microscope (TEM), Scanning Electron Microscope (SEM) and Atomic Force Microscope (AFM), Microtomy – Basic and Freezing microtome – specimen preparation.

UNIT-II (13 hr)

Working of LAF, Biosafety cabinets, Incubator**,** Colony counters, Haemocytometer, Micrometry, Autoclaves, Colorimeter/Spectrophotometer, Inoculation loops, pH meter, Serial dilutions, Methods of Inoculations: Pour plate, Streak method, Spread plate, Stab inoculations, Physical and Chemical Sterilization methods; heat sterilization, moist , use of chemicals alcohols and disinfectants

UNIT-III (13 hr)

Isolation of bacteria, Fungi, Actinomycetes, Cyanobacteria -Physical and Chemical requirements for growth; Culture Media and types; simple, complex and special media, Growth kinetics and growth curve, anaerobic culture techniques. Methods of Preservation of Cultures; subculturing, glycerol stock, Cryopreservation, Liquid Nitrogen, Bacterial Culture collection centre's, ATCC, MTCC., Staining Technique: Principle, procedure and Types-Simple, Differential, Negative, Flagellar, Endospore, Cell wall and Capsule.

UNIT-IV (13 hr)

Principles and applications of Centrifugation, Sedimentation coefficient, Rotors and types, Analytical and preparative Ultra centrifugation, Electrophoresis, Principles of Agarose, SDS PAGE and applications, 2-D gel Electrophoesis, Iso electric focusing, Spectroscopy; mass spectroscopy, MALDI-tofSpectrscopy, NMR, Atomic spectroscopy, Chromatography; Gel filtration, Ion exchange,Affinity, HPLC,GCMS;