

## COURSE OBJECTIVES AND COURSE OUTCOMES

### T. Y. B. Sc. SEMESTER - V

#### SUBJECT: MICROBIOLOGY PRACTICAL (USMBP05 & USMBP06)

Sr. No.	Course Objectives	Course Outcomes
1)	To examine the effect of UV light on the survival of bacteria, select, isolate and isolate UV induced mutants using gradient plate and replica plate techniques	Determining the killing time for given bacteria using UV light, isolation and characterization of UV- induced mutants
2)	To inspect the isolation and detection of plasmid and its DNA. & To illustrate acid fast staining and use rapid diagnostic tests	Gaining knowledge of methods to isolate plasmid (Miniprep method and Agarose gel technique) Understanding the role of microscopy to detect Mycobacterium tuberculosis
3)	To explain bacteriological diagnosis using microscopy, cultural and biochemical tests	Hands-on training comprising of various methods (gold standard) to identify bacterial pathogens (microscopy, rapid test, growth on specific media, biochemical etc.), Understanding selection and testing of antibiotics for specific bacterial pathogen & To learn the significance of rapid diagnostic tests along with hands on training(can be cut)
4)	To plan preparation of bacterial antigens & To investigate the isolation of organisms (bioluminescent), oxidative & fermentative metabolism	Hands-on training to prepare H antigen of salmonella species to be used for the rapid test & Learning methods to isolate bioluminescent bacteria, study oxidative & fermentative metabolism
5)	To illustrate the homo- and hetero-fermentative activity of yeasts	Understanding the differences in homo- & hetero- fermentation by yeasts and hence its applications for the production of industrially important products

6)	To evaluate enzymatic activity in varied conditions – detection & isolation of mitochondria by DCPIP method, detection of glucose by GOD/ POD method and phosphatase activity.	Understanding the use of different enzymes in detection of mitochondrial activity in plants, glucose in human sera or urine and qualitatively & quantitatively assay phosphatase activity
7)	To evaluate alcohol fermentation of a sugar substrate using yeast as the fermenting organism. This includes MICs & chemical estimation of sugar & alcohol and calculation of fermentation efficiency.	Learning to set up an industrial manufacturing unit for alcohol production on a pilot scale
8)	To recommend solid substrate fermentation using the example of the production of amylase from corn & To plan isolation of antibiotic producing microorganisms from a natural environment like soil and studying its antimicrobial spectrum by agar steak/strip method	Understanding solid substrate fermentation using corn as a substrate to obtain amylase enzyme & Learning isolation of microorganisms producing antibiotic substances and checking its antimicrobial spectrum by agar steak/strip method

### T. Y. B. Sc. SEMESTER - VI

#### SUBJECT: MICROBIOLOGY PRACTICAL (USMBP07 & USMBP08)

Sr. No.	Course Objectives	Course Outcomes
1)	To outline isolation and measurement of concentration of genomic DNA and restriction digestion To get the basic concepts of Animal cell culture & Plant tissue culture	Hands on training to isolate, purify and measure the concentration of genomic DNA and demonstrate activity of restriction enzymes, ATC and PTC
2)	To complete enrichment and enumeration of phages and To explain the working of lac operon by performing Beta galactosidase assay	Hands on training to count viral particles & function of lac operon using Lac + and Lac- mutant of E.coli by performing Beta galactosidase assay

3)	To construct Bioinformatics experiments	Hands on training to Explore various databases.; Fish out homologs; Restriction analysis; Pairwise and multiple alignment; Formation of phylogenetic tree
4)	To examine blood smear malarial parasite, selection and testing of antibiotics using Kirby-Bauer method, Cidal concentration of drug for a pathogen	Orienting students for observing malarial parasites in stained blood smear & training for selection and testing of antibiotics against specific pathogens
5)	To investigate serological methods including finding ABO & Rh groups, testing presence of incomplete antibodies (Coombs test), isoagglutination & diagnostic tests for typhoid and syphilis	Hands on training and interpretation of results in determining blood group (ABO,Rh) by direct and indirect methods, incomplete antibodies, dangerous universal donor, diagnosis of typhoid and syphilis (Widal and VDRL)
6)	To examine PHB producing bacteria and to study catabolite repression & analyze, nitrosification and nitrification, proteins & uric acid and to study enzymatic activities protease and lipase, penicillin and phenol	Learning to detect PHB producing bacteria qualitatively and understanding catabolite repression using the diauxic growth curve, the breakdown of amino acids, estimate protein, protease, uric acid, penicillin & phenols
7)	To investigate bioassays for growth promoting and growth inhibiting substances	Learning to estimate potency of growth promoting / inhibiting substances using bioassay methods as per industrial requirement
8)	To analyze enzymatic (invertase) activity of immobilized enzymes using sodium alginate beads	Learning to immobilize yeasts in sodium alginate beads to use their enzymatic (invertase) activity and evaluating the loss of activity after one run of the substrate by viable count method
9)	To illustrate sterility testing of products available in the market & To explain plant tissue culture	Understanding the conditions under which a product is certified as sterile by using sterility tests prescribed in the Indian Pharmacopia