PRACTICALS (HARD CORE COURSES)

BTP 506 MICROBIAL BIOTECHNOLOGY

Course outcome

The student will

CO 1. get hand-on practical skills in fermentation
CO 2. learn about microbial assays,
CO 3. develop pilot scale production of beverages
CO 4. experiment on microbial uses in agriculture

Submerged and solid state fermentation
Estimation of microbial biomass
Estimation of microbial enzymes, mycotoxins, organic acids and antibiotics
Microbiological assays (antibiotics, amino acids and vitamins)
Properties of microbial exopolysaccharides (e.g. cell immobilization)
Uses of Chitin and its derivatives
Pilot scale production of alcoholic beverages
Microbial interactions with plants (rhizobia, mycorrhizas) and plant production
Assessment of nitrogen fixation (acetylene reduction test)
Phosphate solubilization in bacteria, fungi and actinomycetes
Qualities of biofuels (e.g. biodiesel, biogas)

BTP 507 PLANT BIOTECHNOLOGY

Course outcome

The student will

CO 1. learn the set-up of a plant tissue culture lab
CO 2. develop hand-on practical skills in plant tissue culture methods
CO 3. learn the use of media, hormones etc,
CO 4. study early development of plants, protoplast culture etc.

Estimation of plant hormones (e.g. auxins, gibberellins)
Plant tissue culture methods
Callus culture (compact and friable)
Ovule and anther culture
Cell suspension cultures
Embryogenesis
Synthetic seeds
Protoplast preparation
Protoplast fusion techniques
Plant cell immobilization
Methods of inducing resistance through tissue culture

PRACTICALS (SOFT CORE COURSES)

BTP 508 IMMUNOTECHNOLOGY

Course outcome

The student will:

CO 1. learn the immune system structure and function
CO 2. carry out experiments to quantify immune cells
CO 3. get hands-on training in various immunological assays of medical and diagnostic importance
CO 4. develop skills in immunotechnology

Study of immune system in rats
Blood film preparation and study of immune cells
Histology of organs of immune system
Study of insect hemocytes
Production of antiserum
Isolation of lymphocytes
Antigen-antigen reactions (*in vitro*)
Phagocytosis (*in vitro*)
Immunodot technique
Immunodiffusion technique
Immunological diagnosis of pregnancy and infection
Demonstration of ELISA technique

BTP 509 BIOINFORMATICS AND BIOSTATISTICS

Course outcome

The student will:

CO 1. learn about biological databases
CO 2. learn to retrieve sequences
CO 3. carry out analysis including phylogenetic tree construction and molecular modelling
CO 4. get hands-on training in biostatistics

Biological databases - BLAST, FASTA
Restriction mapping
Mean SEM, Histogram
Student's t-test
ANOVA

BTP 510 MEDICAL BIOTECHNOLOGY

Course outcome

The student will

CO 1. learn the basics of various medical tests
CO 2. develop skills in diagnostic testing
CO 3. learn about skills required in clinical laboratories for diagnosis
CO 4. learn the various abnormalities

Hemagglutination test
Antibiotic sensitivity
Karyotype preparation
Chromosomal staining techniques
Avidin-biotin technique in immunohistochemical staining
Immunoblot