

**KARPAGA VINAYAGA COLLEGE OF ENGINEERING AND  
TECHNOLOGY  
MADURANTHAGAM TALUK-603 308**

**Department: Biotechnology**

**Semester/year: III/II Year**

**Subject : Bio-Organic Chemistry Practicals**

**Subject Code : BT 1205**

**LIST OF EXPERIMENTS**

1. Synthesis of Aspirin
2. Hydrolysis of Sucrose
3. Preparation of Pyruvic acid from Tartaric acid
4. Preparation of Oleic acid from tartaric acid
5. Preparation of alpha d-glucopyranose penta acetate
6. Preparation of 1,2,5,6 dicyclohexylnoine alpha d –glucofuranose
7. Isolation of lycopene from tomato paste.
8. Preparation of l- Proline
9. Preparation of l- Cystiene from hair.
10. Preparation of S- ethyl hydroxybutonate from n ethyl acetoacetate using yeast.

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**Department: Biotechnology**

**Semester/year: III/II Year**

**Subject : Biochemistry Practicals**

**Subject Code : BT 1152**

**LIST OF EXPERIMENTS**

1. General guidelines for working in biochemistry lab(theory).
2. Units of volume ,weight, density and concentration measurements and their range in biological measurements.Demonstration of proper use of volume and weight measurements devices.
3. Accuracy, Precision, Sensitivity and Specificity(theory).
4. Preparation of buffer titration of a weak acid and a weak base.
5. Qualitative tests for carbohydrates – Distinguishing reducing sugar from non-reducing sugars and keto from aldo sugars.
6. Quantitative method for aminoacid estimation using Ninhydrin – distinguishing amino from imino acid.
7. Protein estimation by Biuret and Lowry method.
8. Protein estimation by Bradford and spectroscopic methods.
9. Extraction of lipids and analysis by TLC.
10. Estimation of nucleic acids by absorbance at 260nm and hyperchromic effect (demo).
11. Enzymatic assay: Phosphotase from potato.

12. Enzymatic assay :Estimation of glucose by TGO method after hydrolysis of starch with acid and specificity of the enzymatic method.

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**Department:Biotechnology**

**Semester/year:III/II Year**

**Subject : CELL BIOLOGY LAB**

**Subject Code : BT1206**

**LIST OF EXPERIMENTS**

1. Introduction to principles of sterile techniques and cell propagation.
2. Principles of microscopy, phase contrast and fluorescent microscopy.
3. Identification of given plant, animal and bacterial cells and their components by microscopy,
4. Leishman staining.
5. Thin layer chromatography,
6. Giemsa staining,
7. Separation of peripheral Blood Mononuclear Cells from blood,
8. Osmosis and Tonicity,
9. Tryphan Blue Assay,
10. Staining for different stages of mitosis in Alliumcepa (Onion).

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**Department:Biotechnology**

**Semester/year:V/III Year**

**Subject : BIOPROCESS LAB**

**Subject Code : BT1306**

**LIST OF EXPERIMENTS**

1. Estimation of protein concentration of lowry's method.
2. Estimation of glucose by ortholudine method.
3. Isolation of microorganism producing alpha – amylase.
4. Isolation of microorganism producing antibiotics.
5. Isolation of fungi from spoiled food sample.
6. enzyme immobilization
7. Effect of pH on enzyme activity.
8. Effect of temperature on enzyme activity
9. Growth curve studies
10. Fermenter studies.

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**Department:Biotechnology**

**Semester/year:V/III Year**

**Subject : GENETIC ENGINEERING**

**Subject Code : BT1307**

**LIST OF EXPERIMENTS**

1. Preparation of plasmid DNA
2. Elution of DNA from agarose gels
3. Ligation of DNA into expression of vectors
4. Transformation
5. Optimizations of inducer concentration for recombinant protein expression
6. optimization of time inducer for recombinant protein expression
7. SDS-PAGE
8. Western blotting
9. Hybridisation with anti-sera
10. PCR

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**Department: Biotechnology**

**Semester/year: VII/IV Year**

**Subject : DOWNSTREAM PROCESSING**

**Subject Code : BT1404**

**LIST OF EXPERIMENTS**

1. Basic calculations.
2. Supporting experiments
3. introduction to downstream processing laboratory
4. Solid – Liquid separation operations
  - a) Ultra filtration
  - b) Flocculation
  - c) Centrifugation
  - d) Sedimentation ( Batch)
5. Cell disruption techniques.
  - a) Disruption of fungal cell
  - b) Disruption of plant tissue
  - c) SDS lysis of bacterial cell
  - d) Ultra sonication of yeast cell
  - e) Animal cell lysis.
6. Partial purification techniques
  - a) Intracellular product purification
  - b) Extracellular product purification

7. Purification techniques

- a) Sublimation
- b) Distillation
- c) Dialysis

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**Department: Biotechnology**

**Semester/year: VII/IV Year**

**Subject : Immunology**

**Subject Code : BT 1405**

**LIST OF EXPERIMENTS**

1. Handling of animals, Immunization and raising antisera
2. Identification of cells in a blood smear
3. Identification of blood group
4. Immunodiffusion and Immunoelectrophoresis
5. Widal test
6. ELISA
7. Isolation of peripheral blood mononuclear cells
8. Isolation of monocytes from blood
9. Immunofluorescence
10. Identification of T cells by T cell resetting by sheep RBC

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**Department:Biotechnology**

**Semester/year:VII/IV Year**

**Subject Code:BT 1403**

**Name of the Lab:ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY**

**(DEMONSTRATIONS AND SEMINAR)**

**LIST OF EXPERIMENTS**

1. Principles of various types of Centrifugations.
2. Principles of chromatography- TLC, PAPER, &SILICA,  
COLUMN- SILICA, ALUMINA, HPLC.
3. Principles of Electrophoresis- 2D GEL and Isoelectric focusing
4. Principles of Immunological techniques- ELISA, cell identification using  
Monoclonal antibodies, &PCR, FACS.
5. Principles of Electrophoration RFLP&DNA sequencing

## 6. Running of a pilot fermenter

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**Department:Biotechnology**

**Semester/year: VI/IIIYear**

**Subject Code:BT 1355**

**Name of the Lab:Bioprocess lab II**

**LIST OF EXPERIMENTS**

1. Effect of Temperature on the growth of bacteria.
2. Study of Batch Sterilization process in a fermentor.
3. Determination of overall heat transfer coefficient.
4. Power correlation an analysis.
5. Estimation of the biomass for protease.
6. Estimation of  $K_{La}$  by dynamic gassing out method.
7. Determination of Volumetric Mass transfer coefficient  $k_{La}$  by power correlation method.

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**Department:Biotechnology**

**Semester/year:IV/II Year**

**Subject Code:BT 1257**

**Name of the Lab: Molecular biology lab**

**LIST OF EXPERIMENTS**

1. Isolation of plasmid DNA from Bacteria.
2. Isolation of Plant genomic DNA.
3. Agarose gel Electrophoresis.
4. Restriction enzyme digestion.
5. Preparation of Competence cell.
6. Bacterial Transformation.
7. Isolation of Animal genomic DNA.

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**Department: Biotechnology**

**Semester/year: IV/II Year**

**Subject Code: BT 1256**

**Name of the Lab: Instrumental methods of analysis lab**

**LIST OF EXPERIMENTS**

1. Determination of  $\lambda$  max with Potassium permanganate.
2. Validating Beer lamberts law using Potassium permanganate.
3. UV spectra of nucleic acids.
4. Estimation of Sodium Sulphate by Nephelometry.
5. Estimation of Potassium Sulphate by Nephelometry.
6. Separation of Amino acids by Thin Layer Chromatography.
7. Separation of Vitamins by Thin Layer Chromatography.
8. Separation of Plant pigments by Column Chromatography.
9. Determination of Pka value using p-Nitro phenol using absorption spectroscopy.
10. Estimation of Sulphate by Flame photometry.

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**Department:Biotechnology**

**Semester/year:IV/II Year**

**Subject Code:BT 1207**

**Name of the Lab: Microbiology lab**

**LIST OF EXPERIMENTS**

1. Sterlization of glass wares.
2. Gram staining.
3. Acid fast staining.
4. Capsular staining.
5. Preparation of nutrient broth.
6. Preparation of nutrient agar.
7. Pour plate method.
8. Spread plate method.
9. Streak plate method.
10. Enumeration of bacterial number by Haemocytometer.
11. Isolation of Micro organisms from soil.
12. Isolation of Micro organisms from water.
13. Isolation of Micro organisms from milk.
14. Antibiotic sensitivity by Kirby Bauer method.
15. Growth curve.
16. Effect of disinfectants on bacterial growth.
17. Effect of temperature on bacterial growth.

18. Effect of pH on bacterial growth.
19. Effect of UV irradiation on bacterial growth.

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**Department:Biotechnology**

**Semester/year:IV/II Year**

**Subject Code:BT 1258**

**Name of the Lab: Chemical engineering lab**

**LIST OF EXPERIMENTS**

1. Introduction to Chemical process.
2. Flow measurement using orifice meter.
3. Flow measurement using venturi meter.
4. Pressure drop across straight pipe.
5. Pressure drop across annular pipe.
6. Pressure drop across packed bed column.
7. Pressure drop across Fluidized bed.
8. Size reduction using Jaw crusher.
9. Rotary drum filtration.
10. Leaf filtration.

11. Overall heat transfer coefficient of shell and tube heat exchanger in parallel flow.
12. Overall heat transfer coefficient of shell and tube heat exchanger in counter flow.
13. Batch sedimentation.
14. Batch adsorption.
15. Simple distillation.