Subject Code: 02BT0456

Subject Name: Lab II

M. Sc. Semester - II

Objectives: To enable students with practical skills of Bioanalytics, Biostatistics, Bioinformatics Immunology and Molecular Biology.

Credits Earned: 6 Credits

Course Outcomes: After completion of this course:

1. Students will be able to plan and execute experiments in Bioanalytics, Biostatistics, Bioinformatics Immunology and Molecular Biology.

2. Select the appropriate methodology and instrumental technique relevant to a particular task.

3. Students will be able to handle analytical instruments independently.

4. Students will be able to analyze and interpret the data using modern biological tools.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE(I)	Viva (V)	Practical	
0	0	12	6	0	0	0	100	100	200

Contents:

Module	List of Experiments	Contact Hours
1	**Bioanalytics** 1. To perform density gradient centrifugation of given sample. 2. To determination of absorption maxima of different solutions. 3. To perform solvent-solvent chromatography with the given sample. 4. To perform thin layer chromatography with the given sample. 5. To perform paper chromatography with the given sample. 6. To perform column chromatography with the given sample. 7. To perform partial purification of enzyme using dialysis.	45
2	**Biostatistics and Bioinformatics** 1. Statistical data analysis using excel / SAS / SPSS. 2. Statistical tests using online servers GraphPad / OpenEpi / SISA. 3. Exploration of various sequence and structural databases and data mining. 4. Pair wise, global and local sequence alignments and scoring. 5. Multiple sequence alignment and Phylogenetic tree construction. 6. Protein sequence to secondary structure prediction. 7. Protein tertiary structure prediction (domain and motif similarity). 8. Protein structure to function annotation. 9. To perform Homology modelling for a given protein.	45
3	**Immunobiology** 1. To determine the blood group from given blood sample. 2. To perform the DOT ELISA on given serum sample. 3. To perform the single radial immunodiffusion assay. 4. To perform the double radial immune diffusion assay. 5. To perform rocket electrophoresis from given sample 6. To perform the RPR test on the given sample. 7. To perform Widal Test on the given sample. 8. To perform the differential count of WBC from blood.	45
4	**Principles of Molecular Biology** 1. Isolation of Genomic DNA from bacteria/plants. 2. Isolation of Bacterial Plasmid by alkaline lysis method. 3. Qualitative and quantitative estimation of DNA. 4. Agarose Gel Electrophoresis of DNA. 5. To estimate the melting temperature of DNA. 6. Isolation of total RNA form bacteria/plant. 7. Separation of proteins using SDS PAGE.	45
	Total Hours	**180**