Syllabus for Master of Science in Biotechnology

Subject Code: 02BT0406

Subject Name: Lab I

M. Sc. Semester - I

Objectives: To enable students with practical skills of Biochemistry, Cell Biology, Enzymology and Microbiology.

Credits Earned: 6 Credits

Course Outcomes: After completion of this course:

1. Students will become aware of the Lifescience related instruments.
2. Students will learn to prepared basic solutions for experiments.
3. Students will be able to plan and execute experiments in Biochemistry, Cell Biology, Enzymology and Microbiology.
4. Students will be able to analyze, interpret and record the experimental results.

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)	Practicals/ TW	
0	0	12	6	0	0	0	100	100	200

Contents:

Module	List of Experiments	Contact Hours
1	**Biochemistry** 1. Preparation of solutions: Molar solution, Normal solution, Molal solution and Percent solution (w/w, w/v, v/v). 2. Qualitative estimation of proteins. 3. Qualitative estimation of carbohydrates. 4. Quantitative estimation of proteins. 5. Quantitative estimation of carbohydrates. 6. Quantitative estimation of Nucleic Acids. 7. Determination of Isolectric point of casein. 8. Analysis of oils to determine the saponification value, Iodine number and acid number.	45
2	**Cell Biology** 1. Observation and identification of different phases of Mitosis. 2. Observation and Identification of different phases of Meiosis. 3. Identification of economically important bacteria and fungi. 4. To assay the SDH and acid phosphatase activity from isolated mitochondria and lysosomal preparations. 5. To perform cellular fractionation by density gradient centrifugation. 6. Observation and identification of Barr bodies. 7. Observation of various human karyotypes (via Images) to identify normal and genetic alterations.	45
3	**Enzymology** 1. To determine the effect of substrate concentration on enzyme activity. 2. To determine the effect of enzyme concentration on enzyme activity. 3. To investigate the effect of pH and temperature of the enzyme activity. 4. To determine the effect of activators and inhibitors/activators/metal ions in enzyme activity. 5. To perform immobilization of enzymes using calcium alginate method. 6. To determine the total activity, specific activity and turn over number of enzyme from given source. 7. To determine the blood glucose level by GOD POD method.	45

4	**Microbiology** 1. Staining: Gram's Staining, Capsule staining, Endospore staining. 2. Study of Growth curve of *E. coli* bacteria by turbidometric method. 3. Effect of Environmental factors on growth of bacteria: Temperature/ pH/ Heavy metals. 4. Isolation and cultivation of Fungi. 5. Isolation of bacteriophages from sewage sample. 6. Determination of Minimum bactericidal concentration/ Minimum inhibitory concentration of Antibiotic. 7. Disc tests for detection of ESBL/ MRSA-producing *Enterobacteriaceae*.	45
	Total Hours	**180**