

(APPENDIX-VI)

**SYLLBUS FOR M.SC. (BIOTECHNOLOGY / APPLIED MICROBIOLOGY)**

**BIOLOGY (10+2+3 Standard)**

**Unit 1:- General Biology**

Taxonomy; Heredity; Genetic variation; Conservation; Principles of ecology; Evolution; Techniques in modern biology.

**Unit 2 :-Biochemistry and Physiology**

Carbohydrates; Proteins; Lipids; Nucleic acids; Enzymes; Vitamins; Hormones; Metabolism; Photosynthesis. Nitrogen Fixation, Fertilization and Osmoregulation; Nervous system; Endocrine system; Vascular system; Immune system; Digestive system, Reproductive System.

**Unit 3 :-Basic Biotechnology**

Tissue culture; Application of enzymes; Antigen-antibody interaction; Antibody production; Diagnostic aids.

**Unit 4 :-Molecular Biology**

DNA; RNA; Replication; Transcription; Translation; Proteins; Lipids; Membranes; Gene transfer.

**Unit 5:-Cell Biology**

Cell cycle; Cytoskeletal elements; Mitochondria; Endoplasmic reticulum; chloroplast; Golgi apparatus; Signaling.

**Unit 6:-Microbiology**

Isolation; Cultivation; Characterization and enumeration of virus; Bacteria; Fungi; Protozoa; Pathogenic micro-organisms.

**CHEMISTRY (10+2+3 Standard)**

**Unit 1 :-Atomic Structure**

Bohr's theory and Schrodinger wave equation; Periodicity in properties; Chemical bonding; Properties of s, p, d and f block elements; Complex formation; Coordination compounds; Chemical equilibria; Chemical

thermodynamics (first and second law); Chemical kinetics (zero, first, second and third order reactions); Photochemistry;

Electrochemistry; Acid-base concepts; Stereochemistry of carbon compounds; Inductive, Electromeric, conjugative effects and resonance.

**Unit 2 :-Chemistry of Functional Groups**

Hydrocarbons, alkyl halides, alcohols, aldehydes, ketones, carboxylic acids, amines and their derivatives; Aromatic hydrocarbons, halides, nitro and amino compounds, phenols, diazonium salts, carboxylic and sulphonic acids; Mechanism of organic reaction; Soaps and



detergents; Synthetic polymers; Biomolecules-aminoacids, proteins, nucleic acids, lipids and carbohydrates (polysaccharides); Instrumental techniques – chromatography (TLC, HPLC), electrophoresis, UV-Vis-IR and NMR spectroscopy, mass spectrometry, etc.

### **MATHEMATICS (10+2 Standard)**

Sets, Relations and Functions, Mathematical Induction, Logarithms, Complex numbers, Linear and Quadratic equations, Sequences and Series, Trigonometry, Cartesian System of Rectangular Coordinates, Straight lines and Family, Circles, Conic Sections, Permutations and Combinations, Binomial Theorem, Exponential and Logarithmic Series, Mathematical Logic, Statistics, Three Dimensional Geometry, Vectors, Stocks, Shares and Debentures, Average and Partition Values, Index numbers, Matrices and Determinants, Boolean Algebra, Probability, Functions, limits and Continuity, Differentiation, Application of Derivatives, Definite and Indefinite Integrals, Differential Equations, Elementary Statics and Dynamics, Partnership, Bill of Exchange, Linear Programming, Annuities, Application of Calculus in Commerce and Economics.

### **PHYSICS (10+2 Standard)**

Physical World and Measurement, Kinematics, Laws of Motion, Work, Energy and Power Electrostatics, Current electricity, Magnetic Effects of Current and Magnetism, Electromagnetic Induction and Alternating Current, Electromagnetics waves, Optics, Dual Nature of Matter and Radiations, Atomic Nucleus, Solids and Semiconductor Devices, Principles of Communication, Motion of System of Particles and Rigid Body, Gravitation, Mechanics of Solids and Fluids, Heat and Thermodynamics, Oscillations, Waves.