M.Sc. Biology Course Outcomes

Code	Paper Name	Course outcome
BIO1C01	Biochemistry	 The student will appreciate the importance of various chemical interactions in the biological system The Student will develop the ability to analyze the structure, classification, and biochemical properties of carbohydrates from other organic molecules The student will develop the ability to describe classification, structural organization, and purification techniques of proteins. The student will develop understanding of the classification and functions of lipids and fatty acids The Student will develop Appreciation on the mechanism of enzyme action, inhibition, and classification of enzymes that facilitate the functioning of enzymes. The student will develop appreciation on Watson and Crick model of DNA The student will describe the principles of energetics in biological systems. The student will describe the structure and functions of Cellular components, plasma membrane and its models, membrane transport mechanisms and properties, cytoskeletal elements and Intracellular trafficking. The student will explain the cluster and chromosomal alterations, Interrupted genes, gene families and extra chromosomal inheritance The student will explain the cellular adhesion molecules, cell-cell and cell -matrix interactions, intercellular communications along with noted signal transduction pathways and intracellular signaling mechanisms and their significance

BIO1C02	Molecular Biology	• The student will acquire knowledge regarding the mechanism of DNA replication- both chromosomal and extra chromosomal, enzymes involved, models of
		replication, inhibitors and the significance of DNA replication
		• The student learns to know the safeguard systems of DNA, restriction enzymes and their significance, mechanisms involved in damage and repair of eukaryotic DNA and its importance
		• The student will explain the general features of genetic code, special features of the genetic code in mitochondria, and variations in genetic code.
		• The student will explain the structural organization of mRNA in prokaryotes and eukaryotes, the mechanism of transcription, translation, post transcriptional and translational modifications, structure, biogenesis and role of ribosomes in protein synthesis; and RNA editing.
		• The student will explain the regulation of gene expression in Phages, Bacteria, and in Eukaryotes; recent research findings like antisense RNA strategies and role of si RNA and mi RNA in the regulation of eukaryotic gene expression and their applications.
		• The student will describe the components, organization and special features of eukaryotic genome, interrupted genes and their evolution; concept of gene families, and molecular evolutionary clock.
		• The student will explain the transposition mechanisms in prokaryotes and eukaryotes, and their significance.
		• The student will describe the Molecular mechanisms of
		 The student will compare the Special features of microbial genetics, and organelle genome, their replication and mapping
		• The student will explain the regulation of cell cycle, its alteration and causes of cancer. Genes involved in the regulation of cancer and modern therapeutic interventions like immunotherapy and gene therapy.
BIO1C03	Immunology	 The student will appreciate the major findings and milestones in the history of Immunology. An in-depth knowledge will be developed in the process of immune cell synthesis and maturation, antigen receptor structure and the mechanisms of antigen recognition by B-cell and T-cells. The student will explore the Structure and diversity of immunoglobulins, antigens and its classification, production and clinical uses of monoclonal antibodies and antigen antibody interactions.

		 The student will explain the key principles, procedure and applications of different Immune techniques used in the biomedical field and to develop new methods and techniques on the basis of the earned knowledge The student will describe the Mechanisms of humoral and cellular immunity, immune cell receptor and intracellular signal cascades related to immune system activation and response. The student will explore the fundamentals of Immune effector mechanisms, chemical signalling through cytokines, its therapeutic uses and cytokine related diseases. The student will compare the complement system and its components, hypersensitivity and allergic responses, diseases related to hypersensitivity, and complement deregulation. The student will appreciate the scientific principles behind vaccination, types of vaccines, Vaccine technology, their role in fighting diseases and recent advances.
		therapeutic applications.
		• The student will describe the clinical aspects of immune mechanisms involved in various disease conditions like autoimmunity, infectious diseases, tumor immunology, malnutrition and immune deficiency diseases.
BIO1L01	Biochemistry,	• Students will gain skills in methods and
	Molecular biology,	techniques of biochemical assays
	Immunology and Immunotechnology	• Students will appreciate the importance of biochemical assays
		• The student develops practical knowledge to isolate nuclei and genomic DNA from animal tissues.
		• The student acquires hands own training in the
		Quantification of DNA, RNA and Proteins by colorimetric methods and will be able demonstrate electrophoretic methods
		• The student will demonstrate competence in gathering,
		analyzing, synthesizing, evaluating and applying information gathered.
		• Students will gain skill in the immune component analysis and production of antiserum in animals
	Mionolaiste	The student will gain skill in immunotechniques
BI02C04	wiicrobiology	• The student will be able to explain microbial classification and identification of microbes using laboratory methods

		 The Student will analyze the structure of microbial genome and explain the mechanism of viral replication and transpositions The student will develop the ability to describe various microbial fermentation methods and their importance The student will develop an appreciation about bioremediation and other beneficial microbial utilities The Student will describe the human interactions with microbes in terms of gut biota as well as diseases The student will develop appreciation on the significance of microbes in food industry, biogas production and for the industrial production of other chemicals of high utility
BIO2C05	Biophysics	 The student understands the basic principles of physics involved in biological processes. The student develops an understanding about the biological aspects and implications of sound energy The student will be able to differentiate various ionizing radiations and to understand a comparative account of their biological effects. The student may familiarize with various biophysical and electrophysiological methods. The student understands the principles of microscopy. The student develops an understanding of biophysical principles of hearing
		• Introduction and familiarization of Nano technology as a highly promising arena in biomedical applications.
BIO2C06	Ecology and Evolution	 The course will introduce students to the basics of what life is, scales of biological organization and how interactions between an organism and its environment shape all aspects of the organism's biology. A student of the course will understand the fundamentals of biological evolution, how evolution has shaped phenotypic diversity &behavior, and why evolution is a unifying theme in biology. The students will get an idea on molecular evolution and gene expression The students will develop ideas on how the ecosystem functions and contribution to the biotic and abiotic factors affect it The students will develop an understanding on population ecology and the relations of functional ecology The students will develop an understanding on Community ecology

		 The students will have an advance understanding on Behavioural ecology The students will develop an understanding on biodiversity and conservation ecology and their intrinsic relationship with the anthropogenic pressures.
BIO2L02	Biophysics, Microbiology and Ecology	 The student gather hands own experience in isolation, staining and counting of bacteria The student gain better knowledge regarding various sterilization techniques bacterial culture and antibiotic sensitivity tests The student familiarize with the instruments/ techniques in biophysics; PH meter The student will be able to perform Paper chromatography, TLC, Gel electrophoresis, Application of colorimetry in quantitative analysis. The student will explain Tm value and reassociation kinetics of DNA The students will be able to perform various methods to assess the habitat and ecosystems The students will be exposed with the various laboratory mechanisms to understand the species and its interaction with various responses