DEPARTMENT OF BOTANY AND ZOOLOGY

B.Sc. (Medical)

Program Outcomes (PO)

Bachelor of Science (B.Sc.) offers theoretical as well as practical knowledge about different subject areas viz. Botany, Zoology and Chemistry. This programme course is most beneficial for students who have a strong interest and background in Science. The course forms the basis of science and comprises of the subjects like chemistry, botany and zoology. It helps to develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace. To further hone their skills students can go for higher studies i.e. M.Sc and then do some research for the welfare of mankind. Students can join as scientist. Apart from the research jobs, students can also work or get jobs in other technical fields like pharmaceutical, medical, school or college laboratories. Science graduates also recruited in the bank sector to work as customer service executives. Students can also find employment in government sectors.

Program Specific outcome (PSO)

- B.Sc. Medical student is able to acquire knowledge regarding Botany, Zoology and Chemistry.
- Students will be able to define and explain major concepts in the biological sciences.
- They are able to correctly use biological instrumentation and proper laboratory techniques.
- Students will be able to communicate biological knowledge in oral and written form.
- Students will be able to recognize the relationship between structure and function at all levels: molecular, cellular, and organismal.
- They can go for Indian Forest Services and other competitive examinations.
- They can opt for higher studies in Botany, Zoology, Chemistry, Biotechnology, Microbiology and food technology, Human genetics, Environment sciences, Forensic, Biochemistry and Fisheries.

Course specific outcome

CO1: Paper I: Cell Biology

To understand the concepts of the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles. Students will acquire knowledge about chromosomes and cell divisions, both mitosis and meiosis. They will also know about cell signaling.

CO2: Paper II: Non chordates I

To study the diversity of invertebrate fauna and to learn the basics of systematic and understand hierarchy of different categories. Students will also gain an insight into diagnostic characteristics of different phyla.

CO3: Paper III: Non-chordates II

To study the diversity of invertebrate fauna and to learn the basics of systematic and understand hierarchy of different categories. Students will also gain an insight into diagnostic characteristics of different phyla.

CO4: Paper IV: Ecology

To understand core concepts and methods from ecological and physical sciences and their application in environmental problem-solving. Appreciate the ethical and cross-cultural context of environmental issues

and the links between human and natural systems. Reflect critically about their roles and identities as citizens, consumers and environmental factors in a complex, interconnected world.

CO5 Paper V: Chordates

To study the diversity of Protochordate and vertebrate fauna and to learn the basics of systematic and understand hierarchy of different categories. Students will also gain an insight into diagnostic characteristics of different phyla. They will be able to comprehend and appreciate the huge diversity of animal forms existing on the earth ranging from the simplest to the highly complex and largest aquatic or land vertebrates.

CO6: Paper VI: Evolutionary Biology

To explore comparative vertebrate biology in understanding our own biology by learning about the organization, function and adaptive strengths and weaknesses of our own bodies, and how these traits have been shaped by our evolutionary history. Besides, they will also be able to obtain an overview of phylogenetic relationships and evolutionary trends of these organisms. Students will know about population genetics, human evolution, various concepts about origin of species, extinctions, phylogenetic tree making.

CO7: Paper VII: Biochemistry

To explore biochemistry and its scope through scientific enquiry into the nature of biomolecules. Students will understand the basic and fundamental biochemistry of carbohydrates, proteins, lipids and nucleic acids. They will gain knowledge about concept of enzyme, its mechanism of action and regulation; and how this structural information can be utilized for better understanding of biological processes.

CO8: Paper VIII: Animal Physiology

To understand the physiology of digestion, respiration, circulation, excretion, muscles and nerves. They will learn details of endocrinology with classification of hormones, their mode of actions, physiological function, feedback controls and related disorders.

CO9: Paper-IX: Developmental Biology

To learn the different aspects of early, late and post embryonic developments. They will have the knowledge about implications of developmental biology in various fields, such as in teratogenesis, stem cell biology, in vitro fertilization, cryopreservation, cord blood transfusion.

CO10: Paper-X: Genetics

The students will come to know about the concepts of Mendelian and non mendelian inheritance and the role of genes in genetic disorder, gene mutations- various causes associated with inborn errors of metabolism. The course will also provide an insight into the linkage analysis along with the knowledge of population genetics and Genetic engineering.

CO11: Paper XI: Medical Zoology

The course provides an insight into concepts of parasitology and human parasitic diseases and their causal organisms, the types of immunity. The course improves the understanding of fundamental complement of numerous diseases which have significant impact on human health and Understanding of Insect vector host interactions of many important diseases like Malaria, Filaria, and Dengue etc. Course gives insight into physiology, biochemistry and reproduction of insect vectors and their control measures. Students gain

knowledge about the concepts of overview of Entomology. Source reduction and environmental methods for vector control, biological control and other Insect bites.

CO12: Paper XII: Medical Laboratory technology

This course will make students competent to perform a full range of testing in the contemporary medical laboratory encompassing pre-analytical, analytical, and post-analytical components of laboratory services, including Histology, Staining techniques, hematology, chemistry, microbiology, urinalysis, body fluids, and immunohematology. They are also acquainted with the application of safety and governmental regulations and standards as applied to medical laboratory practice.

CO13: Paper-I: Diversity of Microbes

To study and impart knowledge about the general Characteristics, structure, reproduction, life history and economic importance of Fungi. To understand the features of Lichens, Viruses and Bacteria. A general account of mycoplasma, mycorrhiza and cyanobacteria.

CO14: Paper-II: Diversity of Cryptogams

To discuss about importance of morphology, diversity, structure, classification, reproduction, life cycle pattern and economic importance of Algae. To understand the morphological diversity, taxonomic position, occurrence, thallus structure, reproduction and economic importance of Bryophytes and Pteridophytes. Students will learn about the vegetative and reproductive characteristics of the plant genera.

CO15: Paper III: Cell Biology

To gain knowledge about "Cell Science" and understand Cell wall, Plasma membrane, Cell organelles and cell division. To know the details of Microscopy- Principles of light microscopy, electron microscopy (TEM and SEM) and to understand the process of membrane transport and membrane models.

CO16: Paper IV: Genetics and Evolution

To study the phenomenon of dominance, laws of segregation, independent assortment of genes and to understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material, the process of synthesis of proteins and role of genetic code in polypeptide formation. To understand the different types of genetic interaction including Mendelian and Neo-mendelian genetics.

CO17: Paper-V: Diversity and Systematics of Gymnosperms

To Understand the morphological diversity, vegetative and reproductive characteristics, economic importance and evolution of Gymnosperms. To know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features. To understand the plant morphology and basic taxonomy and the scope of Paleobotany, types of fossils, its role in global economy and geological time scale. To explore various fossil gymnosperm genera representing different fossil groups.

CO18: Paper-VI: Diversity and Systematics of Angiosperms

To understand the Phylogeny of angiosperms -A general account of the origin, general range of variations, the characters of biologically important families of Angiosperms. To know the floral variations in Angiospermic families, their phylogeny and evolution; and to understand major evolutionary trends in various parts of Angiospermic plants. Students will know about the different tools in the taxonomy so as to relocate the phylogenetic position of plant or taxa.

CO19: Paper VII: Plant Anatomy

To study the internal structure and function of reproductive organs in plants. To understand the scope & importance and basic aspects of Anatomy of plant tissues such as meristems, epidermis, permanent tissues,

vascular tissues, complex tissue systems, root system, shoot system, normal and anomalous secondary growth in plants and their causes. Students will be benefitted by studying the plant anatomy enables to identify fragmentary plant materials, wood and applied aspects of meristem cultures and anatomy of Leaf

CO20: Paper VIII: Development and Reproduction in Flowering Plants

To restate the conditions necessary for vegetative reproduction in plants, to study the structure development of flower, inflorescence, anther and pistil. To gain insights into male and female gametophytes and post fertilization changes in plants.

CO21: Paper-IX: Plant Physiology

To learn and understand about plant water relations, mineral nutrition, transport of organic substances, enzymology and physiological processes in plants. To understand the phenomenon of Photosynthesis, respiration, nitrogen and lipid metabolism in plants and to know importance and scope of plant physiology.

CO22: Paper-X: Plant Growth, Development and Biotechnology

To understand the fundamentals of seed biology, physiology of growth hormones, photo morphogenesis and recombinant DNA Technology. To understand the principle and basic protocols for Plant Tissue Culture. Students will learn about the basic concept, technical skills, hands-on experience and training in plant tissue culture, molecular biology and role of plant biotechnology in human welfare

CO23: Paper XI: Plant Ecology

Students will understand the basic concepts of general ecology, population and community ecology, ecosystem structure and function. They will understand the importance of various environmental issues, threats to biodiversity and its conservation. Basic concepts related to pollution, biogeochemical cycles, ecological productivity and adaptations.

CO24: Paper XII: Plant Utilization

To understand the role of plants in human welfare. Gain knowledge about various, vegetable and fruit plants, medicinal plants, spice yielding plants of economic use. To study about forest products and plant as source of fibres, beverages, rubber and narcotics. To know about the utility of plant resources.