PROGRAMME OUTCOMESOF B.Sc. DEGREE IN BIOLOGICAL TECHNIQUES AND SPECIMEN PREPARATION

PO1: This program explores scientific skills in Zoology, Biochemistry, Microbiology, Molecular Biology, Biotechnologyand Bioinformatics.

PO2: The program focuses on techniques used in the collection of preservation of plant and animal specimens.

PO3: To train the students in all fundamental aspects of Molecular Biology and Biotechnology, progressively giving way to all essentials of the subject with practical training and exposure to most modern concepts.

PO4: The curriculum also understandsthe students the importance of marketing strategies and effects on entrepreneurial development.

PO5: To help the students to mold themselves as competent enough in an international pursuit.

PO6: Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for the area of specialization with Biology.

PO7: It provides to explore new areas in all branches of Bioscience in addition to interdisciplinary fields.

PO8: The interdisciplinary nature of the subject helps to gain knowledge about effective communication and methods of problem solving skills.

PO9: The interdisciplinary nature of the subject is to be incorporated to have option for employment and higher studies.

PO10: Develop positive attitude towards sustainable development. Students will acquire digital skills and integrate the fundamental concepts with modern tools. Capable of self-paced and self-directed learning aimed at personal and social development.

PROGRAMME SPECIFIC OUTCOMESOF B.Sc. DEGREE IN BIOLOGICAL TECHNIQUES AND SPECIMEN PREPARATION

Students who graduate with B.Sc. BT & SP will,

PSO1: Have significant knowledge on various aspects of Bioscience.

PSO2: Expertise in laboratory techniques of Zoology, Biochemistry, Microbiology, Molecular Biology and Biotechnology.

PSO3: Understand the fundamental concepts in collection and preservation of plants and animals, animal dissection and plant tissue culture.

PSO4: Have ability to plan and execute experiments as well as to analyze & interpret data for any research.

COURSE OUTCOME OF B.Sc. DEGREE IN BIOLOGICAL TECHNIQUES AND SPECIMEN PREPARATION

Total credits:120

SEMESTER 1

Language course

ENGLISH: FINE TUNE YOUR ENGLISH

Course code: EN1CCT01; Credits: 4

CO1.To attain high proficiency in the language.

CO2.To speak and write with ease and confidence.

CO3.To improve the knowledge of the language qualitatively.

CO4.To identify common language errors and correct them.

Core course 1

INTRODUCTION TO BIOLOGICAL SCIENCES; Theory& Practical

Course code: ZB1CRT01; Credits: 3

CO1. To develop proper scientific mind, culture and work habits

CO2. To emphasize the central role that biological sciences plays in the life of all organisms

CO3. To introduce the student to some of the present and future applications of bio-sciences

Core course 2 COLLECTION AND PRESERVATION OF BIOLOGICAL SPECIMEN (PLANTS); Theory & Practical

Course code: ZB1CRT02; Credits: 3

CO1. To introduce the student to some of the collection and preservation of plant specimens

CO2. To develop critical thinking skill and research aptitude among students, byintroducing the frontier areas of the biological science

Core course 3

COLLECTION AND PRESERVATION OF BIOLOGICAL SPECIMEN (ANIMALS);Theory & Practical

Course code:ZB1CRT03; Credits: 3

CO1. To introduce the student to some of the collection and preservation of animal specimens

COMPLEMENTARY COURSES

BIOCHEMISTRY-1;

ELEMENTARY BIOCHEMISTRY;Theory & Practical

Course code: BC1CMT01; Credits: 3

CO1.To introduce the student basic principle of different types of chemical interactions in biological systems, an understanding on the basics of membrane biochemistry.

CO2.Importance of biochemistry of blood and to have a basic understanding of biochemical separation techniques.

CO3.To resolve quantitative problems concerning preparation of solutions and buffers and to have an understanding of basic separation techniques.

ZOOLOGY-1

NON CHORDATE DIVERSITY;Theory & Practical

Course code:ZY1CMT01; Credits: 3

CO1. To study the scientific classification of invertebrate fauna.

CO2. To learn the physiological and anatomical peculiarities of some invertebrate phyla through type Study.

CO3. To learn the unity of life with rich diversity of organisms & evolutionary significance of certain Invertebrate fauna

CO4. To stimulate the curiosity of students' in the biota living around them.

SEMESTER 2

Language course

ENGLISH: ISSUES THAT MATTER

Course code:EN2CCT03; Credits: 4

CO1.To connect theoretical learning in classrooms to current developments in the world and everyday lived experiences.

CO2.to stimulate and sensitize young minds on some of the most pressing issues in the country.

CO3.To sharpen student's critical thinking skills and help them to view issues from diverse angles.

CO4.To allow them to write imaginatively based on their reading of the texts.

Core course 4

GENERAL BIOLOGICAL TECHNIQUES;Theory & Practical

Course code:ZB2CRT04; Credits: 3

CO1. To impart a knowledge and understanding of biological experimental techniques, Includingpractical laboratory skills

CO2. To familiarize with the basic tools and techniques of scientific study with emphasis on biological sciences

Core course 5

TEACHING LABORATORY TECHNIQUES;Theory & Practical

Course code:ZB2CRT05; Credits: 3

CO1. To impart a knowledge and understanding of biological experimental techniques, including practical laboratory skills.

CO2. To learn about laboratory techniques, water, soil and air analyses.

Core course 6

FOOD MICROBIOLOGY & BIOTECHNOLOGY; Theory & Practical

Course code: ZB2CRT06; Credits: 3

CO1. To make aware of different useful microorganisms, their role in food processing and preservation.

CO2. To understand the factors and predict microorganisms, which can cause foodspoilage.

CO3. To understand the causes of foodborne diseases.

CO4. To give a brief outline of food production through biotechnology

COMPLEMENTARY COURSES

BIOCHEMISTRY-2

BIOMOLECULES;Theory & Practical

Course code: BC2CMT02; Credits: 3

CO1.To describe structural characteristics of simple organic biomolecules and their biologically important derivatives indicating the constituent units, linkage between them

CO2.To provide the students an opportunity to develop their qualitative skills and to have a sound knowledge on basic protocols for identification of biomolecules.

ZOOLOGY-2

CHORDATE DIVERSITY;Theory & Practical

Course code: ZY2CMT02; Credits: 3

CO1. To make the student observe the diversity in chordates and their systematic position.

CO2. To make the student ware of the economic importance of some chordates.

CO3. To learn the physiological and anatomical peculiarities of some vertebrate species through type Study.

CO4. To stimulate the students' curiosity in vertebrates living associated with them.

SEMESTER 3

Core course 7

PHYSIOLOGY WITH CLINICAL CORRELATION;Theory & Practical

Course code: ZB3CRT07; Credits: 4

CO1. To inspire the students in learning the frontier areas of biological sciences

CO2. To appreciate the correlation between structure and function of organisms

CO3. To make them aware of the different body systems and the need for maintaining good health through appropriate life style.

Core course 8

CLINICAL CHEMISTRY AND CLINICAL MICROBIOLOGY; Theory & Practical

Course code: ZB3CRT08; Credits: 4

CO1. To inspire the students in learning the frontier areas of biological sciences

CO2. To expose the students to fundamentals in clinical chemistry and to make them appreciate the relevance of the subject in biological studies.

CO3. To make them aware of the pathogens, health related problems, their origin and treatment.

Core course 9

TISSUE CULTURE & GENE MANIPULATION; Theory & Practical

Course code:ZB3CRT09; Credits: 4

CO1. To emphasize the central role that genetics plays in the life of all organisms

CO2. To learn about the tissue culture techniques

CO3. To introduce the student to some of the present and future applications of bio-sciences

CO4. To develop critical thinking skill and research aptitude among students, by introducing the frontier areas of the biological science.

COMPLEMENTARY COURSES

BIOCHEMISTRY-3

ENZYMOLOGY AND METABOLISM; Theory & Practical

Course code: BC3CMT03; Credits: 4

CO1.To introduce the student basics of enzyme catalysis and explain the Majorpathways of carbohydrate, protein and lipid metabolism.

CO2.To make the student understand the basic steps involved in extraction and determination of enzyme activity.

ZOOLOGY-3

PHYSIOLOGY AND IMMUNOLOGY; Theory & Practical

Course code: ZY3CMT03; Credits: 4

CO1. To appreciate the correlation between structure and function of organisms

CO2. To make the student aware of the health related problems, their origin and treatment.

CO3. To understand how efficiently our immune system work in our body.

CO4. To acquire knowledge about preventing common diseases rather than curing.

SEMESTER 4

Core course 10

RADIOLOGY AND ADVANCED INSTRUMENTATION

TECHNIQUES; Theory & Practical

Course code: ZB4CRT10; Credits: 4

CO1. To introduce the student to some of the radiological techniques and its applications

CO2. To develop an awareness about the harmful effects of radiation

Core course 11

ENTREPRENEURSHIP DEVELOPMENT AND

MARKETING; Theory & Practical

Course code: ZB4CRT11; Credits: 4

CO1. To understand the importance of marketing strategies and effects on entrepreneurial development.

Core course 12

RESEARCH METHODOLOGY, BIOPHYSICS AND BIOSTATISTICS; Theory & Practical

Course code:ZY4CRT04; Credits: 4

CO1. To familiarize the learner the basic concept of scientific method in research process.

CO2. To have a knowledge on various research designs.

CO3. To develop skill in research communication and scientific documentation.

CO4. To create awareness about the laws and ethical values in biology.

CO5. To equip the students with the basic techniques of animal rearing collection and preservation

CO6. To help the student to apply statistical methods in biological studies.

COMPLEMENTARY COURSES

BIOCHEMISTRY-4

NUTRITIONAL AND CLINICAL BIOCHEMISTRY; Theory & Practical

Course code: BC4CMT04; Credits: 4

CO1.To explain and schematize the nutritional and biological importance of vitamins and minerals. Explain the clinical significance of organ based function tests and describes the biochemical basis of some important metabolic disorders.

CO2.To introduce the student protocols of quantitative analysis of biomolecules using colorimetric technique and to familiarize qualitative analysis of body fluids.

ZOOLOGY-4

APPLIED ZOOLOGY; Theory & Practical

Course code:ZY4CMT04; Credits: 4

CO1. To acquire basic knowledge and skills in applied branches of zoology.

CO2. To understand the technology for utilizing eco-friendly organisms around them for beneficial purpose.

CO3. To equip the students for self-employment opportunities with scientific knowledge to perform profitably & confidently.

SEMESTER 5

Core course 13

ENVIRONMENTAL BIOLOGY & HUMAN RIGHTS; Theory & Practical

Course code: ZY5CRT05; Credits: 4

CO1.To instill the basic concepts of Environmental Sciences, Ecosystems, Natural Resources, Population, Environment and Society

CO2.To make the students aware of natural resources, their protection, conservation, the factors polluting the environment, their impacts and control measures.

CO3.To teach the basic concepts of toxicology, their impact on human health and remedial measures

CO4.To create a consciousness regarding Biodiversity, environmental issues & conservation strategies

CO5.To develop the real sense of Human rights – its concepts & manifestations

Core course 14

CELL BIOLOGYAND GENETICS; Theory & Practical

Course code: ZY5CRT06Credits: 4

CO1. To understand the structure and function of the cell as the fundamentals for understanding the functioning of all living organisms.

CO2. To make aware of different cell organelles, their structure and role in living organisms.

CO3. To develop critical thinking, skill and research aptitudes in basic and applied biology

CO4. To emphasize the central role of genes and their inheritance in the life of all organisms.

Core course 15

EVOLUTION, ETHOLOGY & ZOOGEOGRAPHY; Theory & Practical

Course code:ZY5CRT07; Credits: 4

CO1.To acquire knowledge about the evolutionary history of earth - living and nonliving

CO2.To acquire basic understanding about evolutionary concepts and theories

CO3.To study the distribution of animals on earth, its pattern, evolution and causative factors

CO4.To impart basic knowledge on animal behavioral patterns and their role

Core course 16

HUMAN PHYSIOLOGY, BIOCHEMISTRY AND ENDOCRINOLOGY; Theory & Practical

Course code: ZY5CRT08; Credits: 4

CO1. This course will provide students with a deep knowledge in biochemistry, physiology and endocrinology.

CO2. Defining and explaining the basic principles of biochemistry useful for biological studies for illustrating different kinds of food, their structure, function and metabolism.

CO3. Explaining various aspects of physiological activities of animals with special reference to humans.

CO4. Students will acquire a broad understanding of the hormonal regulation of physiological processes in invertebrates and vertebrates.

OPEN COURSE

PUBLIC HEALTH AND NUTRITION; Theory

Course code: ZY5OPT02 ; Credits: 4

CO1. To provide students with a general concept of health and the parameters that define health and wellness.

CO2. To understand principles of nutrition and its role in health,

CO3. To provide knowledge and understanding regarding life style diseases.

SEMESTER 6

Core course 17

DEVELOPMENTAL BIOLOGY; Theory & Practical

Course code:ZY6CRT09; Credits: 4

CO1. To achieve a basic understanding of the experimental methods and designs that can be used for future studies and research.

CO2. To provide the students with the periodic class discussions of current events in science which will benefit them in their future studies in the biological/physiological sciences and health-related fields

CO3. To contribute to critical societal goal of a scientifically literate citizenry.

Core course 18

MICROBIOLOGY & IMMUNOLOGY; Theory & Practical

Course code: ZY6CRT10; Credits: 4

CO1.To learn basic concepts of microbial techniques and aspects of general microbiology.

CO2.To achieve basic knowledge in Immunology and how our immune system cope with invading pathogens.

CO3. To make them aware of the pathogens, health related problems, their origin and Treatment

Core course 19

BIOTECHNOLOGY, BIOINFORMATICS & MOLECULAR BIOLOGY; Theory & Practical Course code: ZY6CRT11; Credits: 4

CO1.To achieve a basic understanding of tools and techniques in Biotechnology.

CO2.To understand the various tools used in Bioinformatics.

CO3.To understand the fundamental concepts of Molecular Biology.

Core course 20

OCCUPATIONAL ZOOLOGY; Theory & Practical

(APICULTURE, VERMICULTURE, QUAIL FARMING & AQUACULTURE)

Course code: ZY6CRT12; Credits: 4

CO1. To equip the students with self employment capabilities.

CO2. To provide scientific knowledge of profitablefarming.

CO3. To make the students aware of cottage industries.

ELECTIVE COURSE

NUTRITION,HEALTH AND LIFESTYLE MANAGEMENT; Theory

Course code:ZY6CBT04; Credits: 3

CO1.To provide students with a general concept of health and the parameters that define health and wellness.

CO2. To understand principles of nutrition and its role in health,

CO3. To familiarize the students regarding food safety, food laws & regulations.

CO4. To provide knowledge and understanding regarding life style diseases.

PROJECT WORK

Course code:ZB6PRP01; Credits: 2

On completion of the project work the students are able

CO1. To acquire basic knowledge of research.

CO2. To understand the basic knowledge of preparing the dissertation of project work.

ON JOB TRAINING

Course code:ZB6OJP01; Credits: 3

CO1. Training in the Departments of Microbiology, Biochemistry, Bloodbank, Histopathology & Hematology of Medical College.

CO2. Hands on training in the research labs for learning Molecular and Biotechnological skills.