B.SC. BIOTECH

PROGRAMME OUTCOMES

PO1: Develop a foundational understanding of the basic concepts, principles, and molecular mechanisms of cells, living organisms, and life processes.

PO2: Gain familiarity with advanced and recent biotechnological techniques, tools, and methodologies essential for modern biological research and applications.

PO3: Acquire skills in data analysis and effectively apply bio statistical tools for interpreting experimental and research data.

PO4: Become well-acquainted with multidisciplinary and interdisciplinary subjects, integrating knowledge from advanced scientific courses to build a holistic understanding of biotechnology.

PO5: Identify and propose appropriate solutions to industrial, societal, and research-based challenges through hands-on experience, field visits, and internship programs.

B.SC. BIOTECH

1st SEMESTER

MAJOR	Basics of Biomolecules, Cell Biology
Skill Enhancement Course	Laboratory techniques-I
Ability Enhancement Course	Hindi Bhasha Sanvardhan (One)
Value Added Course	Environmental Science
MINOR	Basics in Biotechnology
Multi Disciplinary Course	Biotechnology for Society

Name of the Course- Basics of Biomolecules
Course Code- 24CBTS401DS01

Course Outcomes-

CO1: Understand physical and chemical basis of biomolecules involved in life processes.

CO2: Demonstrate the knowledge of chemical basis of biomolecules, Classify, define, draw structures and correlate to various properties, functions of carbohydrates.

CO3: Classify, draw structures and correlate the chemical structures of lipids, amino acids, and nucleic acids to their organization, properties and functions.

CO4: Gain fundamental knowledge of proteins biochemistry.

Name of the Course- Cell Biology
Course Code- 24CBTS401DS02

Course Outcomes-

CO1: Understand the structures and functions of basic components of plant and animal cell, especially macromolecules, membranes and organelles.

CO2: Understand how these cellular components are synthesized and degraded in cells

CO3: Explain the structure and function of prokaryotic cell & its components

CO4: Describe the various models and solute transporter systems belonging to cell membrane and will explain cell cycle and apoptosis.

Name of the Course- Laboratory techniques-I
SKILL ENHANCEMENT COURSE
Course Code- 24CBT401SE01

Course Outcomes-

CO1: Practically analyze the samples qualitatively and quantitatively for the presence of various biomolecules.
CO2: Prepare slides of animal and plant cells and cell division and conduct the morphomatric analysis of chromosomes.
CO3: Develop the practical skills of biochemical analysis and cell division.

Name of the Course- Hindi Bhasha Sanvardhan (One)
ABILITY ENHANCEMENT COURSE
Course Code- 23HNDX01AE01

Course Outcomes-

CO1: शुद्ध हिन्दी के प्रयोग में अभिवृद्धि होगी।' (There will be an increase in the use of pure Hindi.)
CO2: 'व्यवसाय एवं रोज़गार की उपलब्धता वाले सभी क्षेत्रों में हिन्दी भाषा में निष्णात युवाओं की सहभागिता में अभिवृद्धि होगी।' (The participation of young people proficient in Hindi language will increase in all fields where business and employment are available.)
CO3: 'अंतरराष्ट्रीय स्तर पर हिन्दी-भाषा के वर्चस्व की स्थापना होगी और हिन्दी-भाषी को देश और विदेश में समुचित सम्मान मिलेगा।' (The dominance of the Hindi language will be established at the international level, and Hindi speakers will receive due respect in the country and abroad.)

Name of the Course- Environmental Science
Value Added Course(VAC)
Course Code- 23EVSX01VA01

CO1: Gain in-depth knowledge on natural processes and resources that sustain life and govern economy.
CO2: Understand the consequences of human actions on the web of life, global economy, and quality of human life.
CO3: Develop critical thinking for shaping strategies (scientific, social, economic, administrative, and legal) for environmental protection, conservation of biodiversity, environmental equity, and sustainable development.
CO4: Acquire values and attitudes towards understanding complex environmental economic- social challenges, and active participation in solving current environmental problems and preventing the future ones.
CO5: Adopt sustainability as a practice in life, society, and industry.

MINOR SUBJECT IN B.SC. BIOTECH-1st YEAR(1st Semester)

Name of the Course- Basics in Biotechnology
Course Code- 24CBT401MI01

Course Outcomes-
CO1: Provide students with a comprehensive understanding of the field of biotechnology, including its historical background, scope, and significance.
CO2: Students will understand the fundamental concepts in biology, chemistry, and related disciplines that form the foundation of biotechnology.
CO3: Students will understand necessary skills required in biotechnology research settings.
CO4: Explore real-world applications of biotechnology in various sectors, such as medicine, agriculture, industrial biotechnology, and environmental biotechnology.

MDC SUBJECT IN B.SC. BIOTECH-1st YEAR(1st Semester)

Name of the Course- Biotechnology for Society
Course Code- 24CBTX01MD01

Course Outcomes-

CO1: Provide students with a foundational understanding of biotechnology, and its historical development.

CO2: Provide students with the significance of biotechnology in various fields such as medicine, agriculture, and the environment

CO3: Provide students with the significance and relevance of biotechnology in daily life.

CO4: Exploration of public perceptions of biotechnology and the challenges of communicating complex scientific concepts to the general public.

B.SC. BIOTECH

2nd SEMESTER

MAJOR	Basics of Microbiology, Basics of Biotechnology
Skill Enhancement Course	Laboratory techniques-II
Ability Enhancement Course	English-I
Value Added Course	Digital and Technological Solutions
MINOR	Principles of Gene Manipulation
Multi Disciplinary Course	Principles of Biotechnology-1

Name of the Course- Basics of Microbiology
Course Code- 24CBTS402DS01

Course Outcomes-

CO1: Illustrate the knowledge of history, scope, classification and various approaches of study of microbes. Compare and characterize prokaryotic and eukaryotic cells based on morphology, different groups of microorganisms based on their structures.

CO2: Illustrate the knowledge of microbial growth, reproduction and exhibit skill of isolation, purification, and preservation of microbial cultures.

CO3: Gain the knowledge of characteristics of viruses, their types and mode of multiplication. Also understand the various control measures of microbes
CO4: Understand the role of micro-organisms in the environment, for making industrially important fermented foods and also gain the knowledge of spoilage of food and food borne diseases.

Name of the Course- Basics of Biotechnology
Course Code- 24CBTS402DS02

Course Outcomes-
CO1 Understand the concepts in biotechnology
CO2: Gain the knowledge of scope and applications of plant biotechnology
CO3: Gain the knowledge of scope and applications of animal biotechnology
CO4: Get an insight of scope and applications of biotechnology in environment, food and chemical industries.

Name of the Course- Laboratory techniques-II
Skill Enhancement Course(SEC)
Course Code- 24CBT402SE01

Course Outcomes-
CO1: Exhibit practical skills in preparation of media and staining of microbes, Isolate bacteria from different sources and determine their count and cell size.
CO2: Gain knowledge of structure, working, maintenance/calibration and safety measures during handling of biotech lab instruments and biochemicals.
CO3: Students will be trained in maintenance of hygiene/aseptic conditions in the laboratory and proper disposal of biochemicals.

Name of the Course- English-I
Ability Enhancement Courses(AEC)
Course Code- 23ENGX01AE01

Course Outcomes-
CO1: To introduce basic concepts of phonetics and train them to transcribe speech sounds using the symbols given in OALD (Oxford Advanced Learner's Dictionary).

CO2: To enable students understand basic grammar and vocabulary so that they can use it for their everyday communication.
CO3: To build elementary level Reading skills of the students to enable them to read and speak sentences frequently.

Name of the Course- Digital and Technological Solutions
Value Added Course(VAC)
Course Code- 23CSAX01VA01

Course Outcomes-
CO1: Knowledge about digital paradigm.
CO2: Realization of importance of digital technology, digital financial tools, e-commerce.
CO3: Know-how of communication and networks.
CO4: Familiarity with the e-governance and Digital India initiatives
CO5: An understanding of use & applications of digital technology.
CO6: Basic knowledge of all machine learning and big data

MINOR SUBJECT IN B.SC. BIOTECH-1st YEAR(2nd Semester)

Name of the Course- Principles of Gene Manipulation
Course Code- 24CBT402MI01

Course Outcomes-
CO1: Students will be introduced to the fundamental principles of genetics, molecular biology, and genetic engineering, providing a solid theoretical foundation for understanding gene manipulation techniques.
CO2: Students will be familiarize with a variety of genetic manipulation techniques, including gene cloning, gene editing.
CO3: Students will explore the molecular tools and technologies commonly used in genetic manipulation.
CO4: Students will explore the diverse applications of gene manipulation techniques in various fields, including biotechnology, medicine, agriculture, and environmental science.

MDC SUBJECT IN B.SC. BIOTECH-1st YEAR(2nd Semester)

Name of the Course- Principles of Biotechnology-1
Course Code- 24CBTX02MD01

Course Outcomes-

CO1: Define and explain the fundamental concepts and principles of biotechnology, including genetic engineering, molecular biology, and cell biology

CO2: Students will demonstrate proficiency in commonly used biotechnology techniques, such as nucleic acid extraction, PCR and cloning.

CO3: Analyze and identify microorganisms using basic microbiological techniques, including isolation, cultivation, and microscopic examination

CO4: Demonstrate awareness of emerging trends and technologies in biotechnology, Regulatory Framework and Biosafety.