Bachelor of Science (B.Sc.) in Life Sciences

Program Overview and Outcomes (Aligned with National Education Policy – NEP 2020)

The Bachelor of Science (B.Sc.) in Life Sciences program is designed to provide students with an integrated understanding of the biological sciences, covering subjects such as Botany, Zoology, Microbiology, Biotechnology, and Environmental Science. The program focuses on the study of living organisms, biological diversity, cellular processes, genetics, physiology, ecology, and molecular biology. Under the National Education Policy (NEP) 2020, the program emphasizes multidisciplinary learning, research aptitude, and sustainability to prepare students for careers in research, healthcare, education, biotechnology, and environmental management.

Nature and Scope of the Program

Life Sciences explore the principles governing living systems through a combination of theoretical knowledge, experimental practice, and field-based learning. Students engage in the scientific study of organisms, ecosystems, and biotechnological applications. The program promotes inquiry-based learning and skill development in laboratory techniques, data analysis, and scientific communication. Graduates are equipped for careers in research laboratories, healthcare, environmental conservation, biotechnology industries, and academia.

Skills Developed

• Analytical and observational skills
• Laboratory and field investigation techniques
• Application of biotechnological and microbiological tools
• Bioinformatics and data analysis
• Scientific communication and research writing
• Ethical and environmental awareness
• Critical thinking and problem-solving in biological contexts

Section I – Program Outcomes (General, NEP 2020 Aligned)

PO1: Demonstrate comprehensive knowledge of biological systems, including structural, functional, and ecological aspects.

PO2: Understand the molecular and cellular mechanisms underlying life processes.

PO3: Apply scientific reasoning and experimental skills to explore and solve biological problems.

PO4: Develop awareness of biodiversity, evolution, and ecological interrelationships among organisms.

PO5: Use scientific tools and digital technologies for biological data collection and analysis.

PO6: Demonstrate ethical responsibility and concern for environmental sustainability.

PO7: Communicate scientific ideas effectively through reports, presentations, and publications.

PO8: Engage in independent and collaborative research across biological disciplines.

PO9: Relate biological knowledge to real-world applications in health, agriculture, and environment.

PO10: Pursue lifelong learning and contribute to scientific innovation and societal development.

Section II – Program Outcomes (Professional and Applied Focus)

PO1: Gain laboratory competence in microscopy, molecular biology, microbiology, and biotechnology techniques.

PO2: Apply experimental methods to assess biological phenomena and environmental changes.

PO3: Interpret experimental data using statistical and computational tools.

PO4: Demonstrate skills in biotechnological innovations and bioresource management.

PO5: Develop awareness of biosafety, bioethics, and sustainable practices.

PO6: Understand the interdisciplinary connections between biology, chemistry, and environmental sciences.

PO7: Work effectively in scientific teams and participate in collaborative research projects.

PO8: Utilize digital and bioinformatics tools to manage and analyze biological data.

PO9: Apply life science principles in industries such as healthcare, pharmaceuticals, and agriculture.

PO10: Pursue advanced education and research in biological, environmental, or allied sciences.

Section III – Summary of Focus Areas and Corresponding Outcomes

Focus Area	Relevant Program Outcomes
Biological Structure and Function	PO1, PO2, PO3
Ecology and Environmental Studies	PO4, PO6, PO9
Biotechnology and Microbiology	PO1, PO4, PO8, PO9
Laboratory Skills and Research Competence	PO2, PO3, PO5, PO7
Ethics, Sustainability, and Lifelong Learning	PO6, PO10