Bachelor of Science (B.Sc.) in Physical Science with Computer Science

Subject Overview and Program Outcomes (As per NEP 2020 & CRSU, Jind)

The Bachelor of Science (B.Sc.) in Physical Science with Computer Science program is designed to provide a strong foundation in Physics, Chemistry, Mathematics, and Computer Science. It integrates theoretical understanding with analytical, experimental, and computational skills. The program follows the National Education Policy (NEP) 2020 framework and aims to prepare students for careers in research, education, data analysis, software development, and technology-driven industries. Students gain an understanding of scientific principles, problem-solving methods, and technological applications for real-world issues.

Nature and Scope of the Program

This interdisciplinary program combines the study of physical sciences with computational technology. It encompasses core scientific concepts such as mechanics, thermodynamics, electromagnetism, atomic and molecular structures, and mathematical modeling, along with computer science subjects like programming, data structures, and algorithms. Students develop analytical reasoning, quantitative aptitude, laboratory skills, and computational proficiency, bridging science with modern technological applications.

Skills Developed

• Analytical and quantitative reasoning
• Experimental and laboratory proficiency
• Computational thinking and programming (C, C++, Python, etc.)
• Data analysis, modeling, and visualization
• Scientific communication and report writing
• Teamwork, ethics, and environmental consciousness
• Application of ICT and software in scientific problem-solving

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

PO1: Demonstrate a comprehensive understanding of Physics, Chemistry, Mathematics, and Computer Science.

PO2: Apply scientific and computational principles to model and solve real-world physical problems.

PO3: Develop hands-on experimental skills and use modern laboratory instruments effectively.

PO4: Use programming languages and computational tools to analyze scientific data and simulations.

PO5: Integrate theoretical knowledge with practical applications in physical and computational sciences.

PO6: Exhibit ethical awareness, environmental responsibility, and professional integrity in scientific work.

PO7: Demonstrate logical reasoning, problem-solving, and analytical thinking across disciplines.

PO8: Communicate scientific and technical ideas effectively in written and oral forms.

PO9: Understand the interdisciplinary nature of science and its technological applications in modern society.

PO10: Develop a mindset for innovation, research, and lifelong learning in science and technology fields.

Section II – Program Outcomes (As per CRSU, Jind)

PO1: Gain strong foundational knowledge in Physics, Chemistry, Mathematics, and Computer Science.

PO2: Apply physical and computational principles to analyze and interpret experimental data.

PO3: Acquire proficiency in laboratory techniques, scientific instrumentation, and ICT applications.

PO4: Develop programming and algorithmic skills applicable in scientific research and industries.

PO5: Understand the role of computer-based modeling and simulations in scientific inquiry.

PO6: Promote scientific reasoning, ethical practices, and awareness of sustainability issues.

PO7: Build competence for research, higher studies, and competitive examinations.

PO8: Demonstrate teamwork, leadership, and effective communication in interdisciplinary environments.

PO9: Apply problem-solving skills in domains such as data science, AI, computational physics, and chemistry.

PO10: Pursue lifelong learning and innovation to adapt to evolving scientific and technological trends.

Section III – Summary of Focus Areas and Corresponding Outcomes

Focus Area	Relevant Program Outcomes
Core Scientific and Computational Knowledge	PO1, PO2, PO5
Laboratory and Experimental Competence	PO3, PO4, PO7
Computer Programming and ICT Skills	PO4, PO9
Ethical and Environmental Responsibility	PO6, PO8
Research, Innovation, and Lifelong Learning	PO9, PO10