



Hiralal Bhakat College

Nalhati, Birbhum

Details of

*Program Outcomes (POs),
Program Specific Outcomes (PSOs)
and
Course Outcomes (COs)*

Department: Physics

Program Name: 3-year Degree in Physics OF BU

CCFUP as per NEP, 2020 with effect from 2023-24

Program Outcomes (POs)

PO1: Students will acquire a scientific temperament.

PO2: Students will gain fundamental practical skills and technical understanding along with domain knowledge of different disciplines in the science stream.

PO3: Students will be equipped fundamental knowledge required for advanced higher studies, professional and applied courses such as Management Studies, Law etc.

PO4: Students will learn about a variety of social and environmental challenges and be able to tackle them with a solution-focused mindset.

PO5: Students who pass all competitive exams in India go on to pursue academic careers and further study.

B.Sc. PHYSICS (Major & Minor)

(Program specific outcomes)

PO. No.

Programs specific outcomes On completing all the courses, the graduates can

PSO1.

The students will acquire a scientific knowledge of the fundamental principles of Physics through study of Classical Mechanics, Electromagnetic Theory, Optics, Heat and Thermodynamics, Statistical Mechanics, Solid State Physics, Nuclear Physics, Modern Physics, Quantum Mechanics and other areas of Physics.

PSO2.

The students will learn use of appropriate level of technology for : a) experimental design and implementation, b) analysis of experimental data, and c) numerical and mathematical methods in problem solving, d) different computational techniques and apply them for experimental data analysis and solving theoretical problems.

PSO3.

The students will acquire a fair amount of computational skill using open source software packages such as Gnuplot, Python, Numpy, Scipy, Matplotlib, Matlab, LaTeX , Arduino IDE etc. in both Linux and Windows platform. This will not only prepare them for higher studies or research in any branch of Physics but also make them ready for various kind of job in IT sector and other industries.

PSO4. The students will learn effective communication skill to present their knowledge of physics from basic concepts to specific advanced areas in the form of preparation of laboratory note book, project work, seminar presentation, poster presentation, wall magazines, models and other modes.

PSO4. The students will learn to work independently as well as a group during laboratory sessions, projects and student seminars.

PSO5.

Students will get academic exposure through the various Internships offered by reputed National Research Institutes during their UG tenure. They will be able to utilize the small summer/ winter recesses through their involvement in small projects under careful guidance of reputed faculties and may get the flavor of the current trend of research.

PSO6.

The student will acquire a purposeful knowledge of scientific literature and ethical issues related to physics

COURSE OUTCOMES:

Semester	Course Type	Course Title & Code	Course learning outcomes (COs)
1st Semester	Major I /DS Course (Core)	MATHEMATICAL PHYSICS-I Code: PHYS1011	<p>Students will be able to:</p> <p>On completion of this course, the student must be able to perform different mathematical operations like calculus and vector operations which are extremely essential to study theoretical and experimental physics</p>
	Minor Course	MATHEMATICAL PHYSICS-I Code: PHYS1021	
	Skill Enhancement Course (SEC 1)	RENEWABLE ENERGY AND ENERGY HARVESTING Code: PHYS1051	<p>Students will be able to:</p> <p>The students are expected to learn not only the theories of the renewable sources of energy, but also to have hands-on experiences on them wherever possible.</p>
2 nd Semester	Major II /DS Course (Core) Code:	MECHANICS PHYS2011	<p>Students will be able to:</p> <p>This course in Mechanics serves as the foundation for further progress towards the study of physics at graduate or post</p>
		MECHANICS Code: PHYS2021	<p>Students will be able to:</p> <p>This course in Mechanics serves as the foundation for further progress towards the study of physics at</p>

	Minor Course		graduate or post
	Skill Enhancement Course (SEC-2)	ELECTRICAL CIRCUITS AND NETWORK SKILLS Code: PHYS2051	<p>Student will be able to:</p> <p>After the completion of the course the student will acquire necessary skills/ hands on experience /working knowledge on Multimeter, voltmeters, ammeters, electric circuit elements, dc power sources. With the knowledge of basic electronics a student can able to detect troubleshoot and repair some of the electronic instruments used in our daily life.</p>

3 rd Semester	Major III /DS Course (Core)	Electricity and Magnetism PHYS3011	<p>Students will be able to:</p> <p>At the end of this course, students will be able to comprehend the concept of electric field, electric flux, magnetic field and their origin. They will learn to apply the Gauss's theorem to find the electric fields for different types of charge distribution. The students will develop a sound perception about Electrostatics, Magneto-statics, Electric current and electromagnetic induction.</p>
	Major/DS Course (Core)	Waves and Optics PHYS3012	<p>Students will be able to:</p> <p>The outcome of the paper includes the knowledge of vibrations, propagation of waves, vibrations of air column, and harmonics of the strings. The paper has another outcome of offering knowledge of wave properties of light & corresponding phenomena.</p>
	Skill Enhancement Course (SEC3)	Basic Instruments and Their Usage PHYS3051	<p>Student will be able to:</p> <p>After completion of this course, the students will gain knowledge the in setting up electrical and optical experiments.</p>

4 th Semester	Major IV /DS Course (Core)	Heat and Thermodynamics PHYS4011	Student will be able to: On completion of this course, the students will learn the kinetic theory of gases, the basic laws of thermodynamics, the applications of the well-known Maxwell's relations, the underlying Physics behind the Joule Thompson effect and the spectral distribution of the blackbody radiation.
		Mathematical Physics-II PHYS4012	Students will be able to: After successful completion of this course, students will be able to formulate problems of Physics in the language of Mathematics.
		Classical Mechanics and Special Theory of Relativity PHYS4013	Students will be able to: On successful completion of this course the students will have in-depth understanding of Lagrangian and the Hamiltonian formulation of mechanics rigid body dynamics, and Special theory of relativity.
	Minor Courses	Thermal Physics PHYS4021	Students will be able to: Upon completion of this course, the students will grasp the idea of laws of thermodynamics, the Blackbody the basics of Statistical mechanics.

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