DEPARTMENT OF PHYSICS
CHANDIDAS MAHAVIDYALAYA
A Govt. Aided Degree College Affiliated to the University of Burdwan
UGC Accrediated under section 2(f) & 12(B) [1979] * NAAC Accrediated in 2016
E-Mail: kiron.phys@gmail.comMobile: 8637022749//9735340332

Program Outcomes: B.Sc. Physics (General) Programme-2022-23

The student graduating with the Degree B.Sc. General in Physics should be able to acquire...

- A fundamental understanding of the academic field of Physics, its different learning areas and applications in basic Physics like Astrophysics, Material science, Nuclear and Particle Physics, Atomic and Molecular Physics, Mathematical Physics, Analytical dynamics, Space science, and its linkages with related disciplinary subjects.
- Procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics.
- Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems and identifying and applying appropriate physical principles and methodologies.
- Recognize the importance of mathematical modeling, simulation and computing.
- Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate software such as programming languages.

Course Outcome: B.Sc. Physics (General) Programme

CORE COURSES (CC)	
Course Name	**Course Outcome**
CC- 1A: MECHANICS	Understand laws of motion and their application to various dynamical situations, notion of inertial and non-inertial frames, concept of conservation of energy, momentum, angular momentum and apply them to basic problems. Understand the analogy between translational and rotational dynamics. Describe special relativistic effects and their effects on the mass and energy of a moving object.
CC-1B: ELECTRICITY AND MAGNETISM	This course will help in understanding basic concepts of electricity and magnetism and their applications. Basic course in electrostatics will equip the student with required prerequisites to understand electrodynamics phenomena.

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CC-1C: THERMAL PHYSICS AND STATISTICAL MECHANICS	This basic course in thermodynamics will enable the student to understand various thermo dynamical concepts, principles. In the laboratory course, the students are expected to do some basic experiments in thermal Physics, viz., determinations of Stefan's constant, coefficient of thermal conductivity, temperature coefficient of resistance, variation of thermo-emf of a thermocouple with temperature difference at its two junctions and calibration of a thermocouple. Learn the basic concepts and definition of physical quantities in classical statistics and classical distribution law. Learn the application of quantum statistics to derive and understand. 1. Bose Einstein statistics and its applications to radiation. 2. Ferm-Dirac statistic and its applications to quantum systems.
CC- 1D: WAVES AND OPTICS	He / she shall develop an understanding of various aspects of harmonic oscillations and waves specially. (i) Superposition of collinear and perpendicular harmonic oscillations (ii) Various types of mechanical waves and their superposition. This course in basics of optics will enable the student to understand various optical phenomena, principles, workings and applications of optical instruments.
DISCIPLINE SPECIFIC ELECTIVE COURSES (DSE)	
Course Name	**Course Outcome**
DSE-1A: ELEMENTS OF MODERN PHYSICS	Comprehend the failure of classical physics and need for quantum physics. Grasp the basic foundation of various experiments establishing quantum physics by doing the experiments in the laboratory and interpreting them. Formulate the basic theoretical problems in one, two and three dimensional physics and solve them. Learning to apply the basic skills developed in quantum physics to various problems in (i) Nuclear Physics (ii) Atomic Physics
OR DSE- 1A: NUCLEAR & PARTICLE PHYSICS	Skills to describe and explain the properties of nuclei and derive them from various models of nuclear structure. To understand, explain and derive the various theoretical formulations of nuclear disintegration like α decay, β decay and □ decays. Develop basic understanding of nuclear reactions and decays with help of theoretical formulate and laboratory experiments. Skills to develop basic understanding of the interaction of various nuclear radiation with matter in low and high energy.

DSE- 1B: QUANTUM MECHANICS	This course shall develop an understanding of how to model a given problem such as particle in a box, hydrogen atom, hydrogen atom in electric fields. Many electron atoms, L-S and J-J couplings. These skills will help in understanding the different Quantum Systems in atomic and nuclear physics.
OR DSE-1B: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION	Acquire skills to understand the functioning and operation of CRO to measure physical quantities in electrical and electronic circuits. Learn the basics of IC and digital circuits, and the difference between analog and digital circuits. Various logic GATES and their realization using diodes and transmitters. Learn the fundamentals of Bolean algebra and their role in constructing digital circuits. Learn about combinatorial and sequential systems by building block circuits to construct multivibrators and counters.Understand basics of microprocessor and assembly language programming with examples.
SKILL ENHANCEMENT COURSES (SEC)	
SEC-1: RENEWABLE ENERGY AND ENERGY HARVESTING	To understand the different kinds of Energy sources. To study the basis of solar energy and solar radiation measurement. To learn the fundamental principles and theory of wind energy conversion systems. Students will acquire enough knowledge about renewable energy resources. Governments around the world are establishing increasingly ambitious targets for renewable energy use. For example, by 2030 China plans to increase the share of non-fossil fuels in its total energy mix to 20% and Europe to 30%. The Renewable Energy course in B.Sc general will prepare you for an exciting and rewarding career helping to address the global challenge of moving to a low carbon economy.
SEC-3: COMPUTATIONAL PHYSICS	The students should learn the skills for writing a flow chart and then writing the corresponding program for a specific problem using the C/FORTRAN language. The student should also acquire the proficiency in effectively using the LINUX operating system and also in using the LaTeX software for writing a text file.
SEC- 4: ELECTRICAL CIRCUITS AND NETWORK SKILLS	Skills to understand various types of DC and AC circuits and making electrical drawings with symbols for various systems. Skills to understand and operate generators, transformers and electric motors. Develop knowledge of solid state devices and their uses. Skills to do electrical wiring with assured electrical protection devices.

K. Mandal

Deptt. of Physics
Chandidas Mahavidyalaya
Khujutipara, Birbhum