PROGRAMME NAME	BSc. HONOURS IN PHYSICS
PROGRAMME SPECIFIC OUTCOME	Undergraduate program in B.Sc. (Honours in Physics) is aimed to impart a complete knowledge in the basics of Physics and its application areas. After successful completion of the course, the employability of the students is increased and they become eligible to pursue higher education and research in Physics.

HONOURS COURSE OUTCOMES			
SEMESTER	**COURSE CODE**	**COURSE TITLE**	**COURSE OUTCOME**
I	CC-1	Mathematical Physics I	Students learn and recapitulate some basic mathematical topics namely calculus (including ordinary differential equations and partial derivatives), vector calculus, orthogonal curvilinear coordinates, probability and Dirac delta function. These mathematical tools are essential for further study of Physics.
I	CC-2	Mechanics	Classical mechanics is divided into two parts - (a) single particle and (b) systems of particles. Each of these parts contain - definition of observables, equations of motion and underlying symmetries. By this way, students learn a wide range of classical mechanics in a systematic manner. Finally the course is extended to relativistic mechanics where students learn the basic ideas of principle of relativity, Galilean and Lorentz transformation and their consequences, four vector, length contraction, time dilation etc.
I	AECC-1	COMPULSORY ENVS	AECC-1 is a compulsory general paper for 1st year undergraduate students. In this paper We teaches the fundamentals of environmental studies.This paper introduces the fundamental principles and concept of environmental science, ecology and related interdisciplinary subjects such as policy, law, Economics, pollution control, resources management etc.
II	CC-3	Electricity and Magnetism	By the study of electricity and magnetism, students become familiar with electric and magnetic fields and their origin. They learn techniques to find electric fields and potential and magnetic fields for various charge and current distributions.

II	CC-4	Waves and optics	This course is intended to give a complete knowledge to the students about the wave phenomena with reference to sound and light. Optical phenomena of interference and diffraction have been included in this course. They will also learn Holography.
II	AECC-2	COMMUNICATIVE ENGLISH/MIL (BENGALI/FRENCH)	COURSE OUTCOME GIVEN SHEET CONTAINING IN ENGLISH , BENGALI , FRENCH AECC-2 (SEMESTER-2)
III	CC-5	Mathematical Physics II	In this course a student learns the various mathematical topics which are useful in learning Physics. These are Fourier series, techniques to solve some very essential differential equations, Gamma and Beta Functions, Theory of Errors and Partial Differential equations.
III	CC-6	Thermal Physics	This course begins with classical thermodynamics to introduce the fundamental concepts of temperature, energy, and entropy. These concepts are then used to explore free energy, heat, and the fundamental behavior of heat engines and refrigerators.
III	CC-7	Digital Systems and Applications	Students come to know the necessity to differentiate between electrical and electronic technologies and also between analog and digital electronics. Objective of studying digital electronics is to learn the design mechanism of different electronic circuits to process signals in two discrete levels following Boolean algebra.
III	SEC-1	Renewable Energy and Energy Harvesting	By the study of this course, students learn various technologies of energy harvesting (such as micromachine technologies, MEMS technology etc), Industrial (such as industrial

			vibration E.H, industrial thermal E.H etc.), buildings, infrastructures, automotive and transportation applications.
IV	CC-8	Mathematical Physics III	This course of Mathematical Physics comprises two broad topics: complex analysis and integral transforms, that have wide applications in Physics. Students learn complex differentiation and integration including residue theorem and properties and applications of Fourier and Laplace transform.
IV	CC-9	Elements of Modern Physics	In this course a student learns the basics of Modern Physics. They get acquainted with a new theory and correspondingly a new Mechanics called Quantum Theory and Quantum Mechanics respectively. One also learns the basic Nuclear Physics and LASER Physics.
IV	CC-10	Analog Systems and Applications	After successful completion of this course a student will gain knowledge about the development of electronics starting from semiconductor diode to Junction transistor. Application of diodes in rectifier circuits, transistors in amplifiers and oscillators, and OPAMP are included here
IV	SEC-2	Electrical Circuits & Network Skills	Students can learn some statements of network theorems and their applications in simplifications of complex networks, basic circuit analysis techniques of mesh current and node voltage approaches, circuits transients and steady state.
V	CC-11	Quantum Mechanics and Applications	The course starts from some basic ideas of linear vector space including the bra-ket algebra and its matrix representation. Consequently it covers the quantum mechanical postulates, which are then implemented to understand various quantum

			mechanical systems like infinite potential well, harmonic oscillator, central force system (characterized by bound states), and, potential well, finite potential barrier (characterized by scattering states) etc.
V	CC-12	Solid State Physics	After studying this course students will be able to explain different properties of matter. They will also learn how the structure of matter is related to the properties exhibited by them and how quantum mechanics is applied to explain them.
V	DSE-1	Advanced Mathematical Physics	This course includes linear vector spaces, matrices and tensors. Students learn to calculate the matrix elements of linear operators, to find eigenvalues and eigenvectors of a matrix and to diagonalize a matrix, to perform various tensor operations etc.
V	DSE-2	Classical Dynamics	Concepts of Lagrangian, Hamiltonian, and small amplitude oscillations are introduced in this course. Students are also taught the special theory of relativity and stream-line motion, laminar flow, Poiseuille's equation, Navier-Stokes equation, etc.
VI	CC-13	Electromagnetic Theory	In this course a student learns the basics of Classical Electrodynamics, Wave Guides and Optical Fibers. One gets acquainted with the various aspects of Electromagnetic Waves, its propagation through various kinds of media and Polarization.
VI	CC-14	Statistical Mechanics	Starting from the necessity of Statistical Mechanics, the course covers classical and quantum statistical mechanics including Bose-Einstein and Fermi-Dirac Statistics. Within such a huge range, the students learn to calculate the partition function, density

			operator (and its necessity), symmetrization (or anti-symmetrization) of particles, Bose-Einstein condensation, Fermi gas etc.
VI	DSE-3	Nuclear and Particle Physics	This course covers nuclear models (liquid drop model, Fermi gas model), radioactive decay(alpha-, beta- and gamma-decay), various types of nuclear reactions, detectors for nuclear radiations(semiconductor-, neutron detectors), particle detectors(Linear accelerator, Cyclotron, Synchrotron) and particle physics.
VI	DSE-4	Astronomy and Astrophysics	In this course, students become familiar with astronomical scales, learn basic concepts of positional astronomy, gain an understanding of astronomical techniques and study some astronomical systems like the sun, solar system, milky way and an introduction to the expanding universe.