BSC (NM)

	Program Outcome (PO)
PO	After completing the three year degree program, students will be able to attain a strong base to pursue higher education in the field of Physics.The main areas of Physics such as Mechanics , Semiconductors ,Thermodynamics ,Wave and Optics , Quantum Mechanics and Nuclear Physics are included in the Physics course curriculum for the undergratuate students . These courses educates the future leaders of the nation
	Program Specific Outcome (PSO)
PSO	After Completing Bachelor of Science , the students will be able to demonstrate a deep and analytical understanding of the Mathematics,Physics and Chemistry subjects.The students can pursue studies in any of the above subjects too.

I Year Semester I	
Course: PH-101 Classical Mechanics & Theory of relativity	
CO-101	Apply transformation equations , generalized notations , applications of theory of relativity.
Course:PH-102 Electricity , Magnetism & Electromagnetic Theory	
CO-102	Use of Vector basic and electric field ,electromagnetism and circuit analysis
I Year Semester II	
Course : PH-201 Properties of Matter & Kinetic Theory of Gases	
CO-201	Understand and apply moment of Inertia , kinetic theory of Gases.
Course : PH-202 Semiconductor Devices	
CO-202	Discuss the applications of transistors ,amplifiers and oscillators
2 Year Semester III	
Course: PH-301 Computer Programming & Thermodynamics	
CO-301	Computer Organisation , Applications of Fortran Programming and various laws of Thermodynamics

Course : PH- 302 Wave & Optics -I	
CO-302	Understand various laws of Interference and Diffraction.
II Year Semester IV	
Course : PH- 401 Statistical Physics	
CO-401	Understand and apply Macroscopic and Microscopic systems , Probability Theory , Postulates of Statistical Physics and Quantum Statics
Course : PH- 402 Wave & Optics -II	
CO-402	Discuss laws of Polarisation , Fourier analysis and Fourier Tranformation.
III Year Semester V	
Course: PH-501 Quantum & Laser Physics	
CO-501	Applications of Schrodinger wave equation, absorption and emissionof radiation, threshold.
Course: PH-502 Nuclear Physics	
CO-502	Applications of Alpha disintegration and its theory, interaction & absorption of Gamma ray.
III Year Semester VI	
Course: PH-601 Solid States & Nano Physics	
CO-601	Discuss Crystal structure, X-Ray diffraction, Super conducting system & Importance of nano scale & nano technology.
Course: PH-602 Atomic & Molecular Spectroscopy	
CO-602	Various quantization laws Orbital magnetic dipole, Penetrating & non Penetrating orbits

Maths Course Outcomes

Semester I		
Course Code	**Course Name**	**COs: After successfully completing this course, students will be able to**
Paper-I	Algebra	○ Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices. Elementary Operations on matrices. Cayley Hamilton theorem and its use in finding the inverse of a matrix. ○ Applications of matrices to a system of linear (both homogeneous and non– homogeneous) equations. ○ Relations between the roots and coefficients of general polynomial equation in one variable. Transformation of equations. ○ Nature of the roots of an equation Descarte's rule of signs. Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions.
Paper-II	Calculus	○ Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. Maclaurin and Taylor series expansions. ○ Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. ○ Tracing of curves in Cartesian, parametric and polar co-ordinates. Reduction formulae, Rectification, intrinsic equations of curve. ○ Quadrature (area) Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution.
Paper-III	Solid Geometry	○ General equation of second degree. Tracing of conics. Tangent at any point to the conic, chord of contact, pole of line to the conic, director circle of conic. ○ Sphere: Plane section of a sphere. Sphere through a given circle. Intersection of two spheres, radical plane of two spheres. Co-axial system of spheres ○ Central Conicoids: Equation of tangent plane. Director sphere. Normal to the conicoid, Polar plane of a point. Enveloping cone of a conicoid. Enveloping cylinder of a conicoid. ○ Paraboloids: Circular section, Plane sections of conicoid, Generating lines. Confocal conicoid. Reduction of second-degree equations.

Semester II		
Course Code	**Course Name**	**COs: After successfully completing this course,students will be able to**
Paper-I	Number Theory and Trigonometry	o Divisibility G.C.D. (greatest common divisors) L.C.M. (least common multiple) Primes, Complete residue system and reduced residue system modulo m. Euler function, Euler's generalization of Fermat's theorem. Chinese Remainder Theorem. o De Moivre's Theorem and its Applications. Expansion of trigonometrical functions, Direct circular and hyperbolic functions and their properties. Inverse circular and hyperbolic functions and their properties. Logarithm for complex quantity
Paper-II	Ordinary Differential Equations	o Geometrical meaning of a differential equation. Exact differential equations, integrating factors. Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self-orthogonal family of curves. o Linear differential equations of second order: Reduction to normal form. Solution of simultaneous differential equations involving predator (dt/dx) (dy/dt) etc. Method of auxiliary equations.
Paper-III	**Vector Calculus**	o Scalar and vector product of three vectors, product of four vectors. Divergence and curl of vector point function, cylindrical co-ordinates and Spherical coordinates. Vector integration; Line integral, Surface integral, Volume integral, Theorems of Gauss, Green & Stokes and problems based on these theorems.
Semester III		
Course Code	**Course Name**	**COs: After successfully completing this course, students will be able to**
Paper-I	Advanced Calculus	o Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Taylor's theorem for functions of two variables. Lagrange's method of multipliers. Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.
Paper-II	Partial Differential Equations	o Partial differential equations: Formation, order and degree, Equations reducible to linear equations with constant co-efficients. Solution of linear hyperbolic equations, Monge's method for partial differential equations of second order. Cauchy's problem for second order partial differential equations.
Paper-III	Statics	o Composition and resolution of forces. Parallel forces. Moments and Couples. Analytical conditions of equilibrium of coplanar forces. Friction. Centre of Gravity. Virtual work. Forces in three dimensions. Point sets central axis, Wrenches.

Semester IV		
Course Code	**Course Name**	**COs: After successfully completing this course, students will be able to**
Paper-I	Sequences and Series	o Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, Neighborhoods. Infinite series: Convergence and divergence of Infinite Series, Infinite series: D-Alembert's ratio test, Raabe's test, Convergence and absolute convergence of infinite products.
Paper-II	Special Functions and Integral Transforms	o Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.
Paper-III	Programming In C & Numerical Methods	o Programmer's model of a computer, Algorithms, Flow charts, Data types, Operators and expressions, Input / outputs functions. Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops. Differential equations involving predator (dt/dx) (dy/dt) etc. Method of auxiliary equations.
Paper-III	Vector Calculus	o Scalar and vector product of three vectors, product of four vectors. Divergence and curl of vector point function, cylindrical co-ordinates and Spherical coordinates. Vector integration; Line integral, Surface integral, Volume integral, Theorems of Gauss, Green & Stokes and problems based on these theorems.
Semester V		
Course Code	**Course Name**	**COs: After successfully completing this course, students will be able to**
Paper-I	Real Analysis	o Riemann integral, Integrability of continuous and monotonic functions, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus. Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests, Frullani's integral.
Paper-II	Groups And Rings	o Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Rings, Subrings, Polynomial rings over commutative rings, Unique factorization domain.
Paper-III	Numerical Analysis	o Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular value, Central Differences: Gauss forward and Gauss's backward interpolation formulae, Numerical Differentiation, Eigen Value Problems: Power method, Jacobi's method, given's method, House- Holder's method, QR method, Lanczos method.

Semester VI		
Course Code	**Course Name**	**COs: After successfully completing this course, students will be able to**
Paper-I	Real And Complex Analysis	o Jacobians, Beta and Gama functions, Double and Triple integrals, Dirichlet's integrals, change of order of integration in double integrals. Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Co-efficients, Dirichlet's conditions.
Paper-II	Linear Algebra	o Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces, Vector space of all the linear transformations Dual Spaces,
Paper-III	Dynamics	o Velocity and acceleration along radial, transverse, tangential and normal directions. Relative velocity and acceleration. Simple harmonic motion. Elastic strings. Mass, Momentum and Force. Newton's laws of motion. Work, Power and Energy. Definitions of Conservative forces and Impulsive forces.