

## Mathematics Course outcome (Under-graduate)

### Course outcome: B.Sc. Part-I

#### Core Course (paper-I)

CO 1. Apply theory of equation to analyse problems related to traffic control, space program etc

CO 2. Apply Set theory to real world from bars to train schedules.

CO 3. Understand comprehensively the rules of Trigonometry and learn to apply to real situations like to determine the height of the roof in building ,cartography etc

CO 4. Understand the rules of Matrices and apply to solve linear equations and multivariate statistical analysis.

CO 5. Learn Linear programming and its applications in to solve real world problems.

#### Core Course (paper-II)

CO 1. Learn the basics of differential calculus and its different applications.

CO 2. Grasp the concepts of Integral calculus and learn its applications to solve problems of Physics.

CO 3. Understand and apply second order equations to different curves like parabola, ellipse, hyperbola and learn the rudiments of conic sections.

CO 4. Understand the analytical geometry of three dimensions and concepts of representation in different coordinate systems rectangular, spherical , polar and cylindrical.

### Course outcome: B.Sc Part-II

#### Core Course (paper-III)

CO 1. Get well conversant with the theory of Real numbers , Cauchy's sequence, convergence, continuity and differentiability of real variables, Taylor's expansion etc .

CO 2. Develop concept of Infinite series and their convergence, Cauchy's root test, condensation test, integral test ,other tests and their applications.

CO 3. Conceptualize binary notion of group, Abelian ,Non- Abelian group, identity and inverse elements, cyclic group, ring, integral domain ,field etc.

#### Core Course (paper-IV)

CO 1. Understand product of three and four vectors, differentiation of vector function, differentiation of product of vectors, gradient, divergence and curl of vector function and their applications.

CO 2. Get requisite skills for formation of Differential equation of first and second order, separation of variables, geometrical applications of first order differential equation, and orthogonal trajectories.

CO 3. Acquire the concept of reduction of a force system into a force and a couple, resultant equation, concept of virtual work in two dimensions, stable equilibrium, energy test for stability with applications.

CO 4. Understand the concept of the components of velocity and acceleration in Cartesian radial and transverse, tangential and normal forms, projectile motion, central force, gravitational force etc

### **Course outcome: B.Sc Part-III**

#### **Core Course (paper-V)**

CO 1. Understand function of two variables, limit, repeated limits, Moore, Osgood Theorem, Continuity and differentiability of function of two variable, Young's and Schwarz condition of equality of implicit function theorem, Taylor's theorem, Maxima, Minima of Functions of two variables, Lagrange's method of undermined multipliers.

CO 2. Conceptualize Riemann integral of bounded function, Riemann Integrability of continuous functions and monotonic function, the fundamental theorem of integral calculus, Mean Value theorem.

CO 3. Get well versed with Improper integral, convergence of an improper integral, comparison tests, Dirichlet's test, Beta and Gamma functions, their properties and relationship, differentiation under integral Double and triple integrals, changes of order of integration, Line, surface and volume integrals Green's Gauss's and stokes theorem.

CO 4. Acquire skills to deal with Weierstrass Sequence and series of functions and their pointwise convergence, Uniform convergence of sequence and series of functions, Weierstrass M-test, uniform convergence and continuity, Dini's test, Abel's test, Dirichlet's Test, Uniform convergence Infinite product and its convergence and their mutual relations, Double series, Elementary notions of metric spaces and topological spaces.

#### **Core Course (paper-VI)**

CO 1. Ruminant and understand essentials of group theory like Centre, Normalizer, Conjugacy, class equation, auto morphisms, inner auto morphisms, Commutator and commutator sub group, Direct Product of two groups, Division ring, Polynomial ring, etc. Imbedding of a ring without unity in a ring with unity, Characteristics of a field, Field of quotients etc.

CO 2. Learn in depth, Vector spaces, Subspaces, Bases and dimension, Linear Transformation, Algebra of linear transformation, Matrix and linear transformation, Rank and nullity of a linear transformation, Direct sum of sub-spaces, characteristic value, characteristic vector etc.

#### **Core Course (paper-VII)**

CO 1. Analyse and apply Motion in a resisting medium, motion of a body about a fixed point, Angular velocity relation between angular velocity and linear velocity of a point of the body general motion of a body, Moment of inertia, Definitions and standard results, Moment ellipsoid and perpendicular axis theorem, Principal axis of inertia (existence of principal axis of inertia at

point) Angular momentum and Kinetic energy of a rigid body rotating about a fixed point etc

CO 2. Get Acquaintance with various terms like Attraction and potential, Attraction and potential of rod, Rectangular and circular dies, Spherical shells, sphere (Laplace's and Poisson equations), Theorem of equipotential surface, Pressure at a point, Thrust on a Plane surface, Centre of pressure, Equilibrium

CO 3. Grasp the skills of dealing with Second order equations with variable coefficients, Solution of second order differential equations with variable coefficients etc.

Core Course (paper-VIII)

CO1. Contemplate over fundamentals of Astronomy and understand Spherical triangle, Fundamental Formula ( Cosine, Sine, Sine-Cosine, Cotangent), Napier's rule.

CO 2. Understand D'Alemberts analogies, right angle triangle, Celestial sphere: Definition: Different System of Co-ordinates.

CO 3. Gain knowledge of Phenomenon of rising and setting of stars, Twilight Solar system, Area integral, Kepler's law, Anomalies, Kepler's Equations, Annual Aberration, Effect of the aberration on celestial latitude and longitude etc.