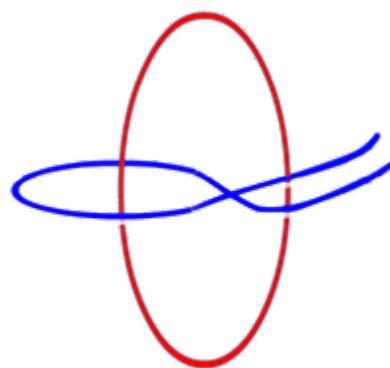


# Cheenta Ganit Kendra

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## College Mathematics Program: Modules

**Complex Analysis:** (10 Hrs) Complex Number in Extended Plane and Spherical Representation, Polar Representation, Properties of roots, Power Series, Analytical Functions, Mobius Transformation, Holomorphic Functions

**Group Theory:** (18 Hrs) Finite Group and Subgroups, Cyclic, Abelian, Groups and Cosets, Lagrange's Theorem, Inner Product, Counting Principle, Permutation Group, homomorphism, isomorphism, Automorphism, Cayley's Theorem, Direct Products, Sylow Theorem

**Linear Algebra:** (15 Hrs) Matrices, Rank, Inverse Matrices, Elementary Operations, Determinants, Null space, Range, Linear Transformation, Matrices Representation, Change of Basis, Invertibility, Isomorphism, Rank Nullity Theorem, Annihilator, Linear Operation characteristics, Eigen value, Vector Diagonalizability, Jordan Form, Rational Form

**Real Analysis:** (24 Hrs) Construction of Real Number, Bounded Sets, Supremum, Infimum, Archimedian Principle, Limit of Sequence, Function, Differentiability, Integration, Line Integral, path Integral, Change of Variables, Partitions of unity, Green's Theorem, Differential Forms, Stoke's theorem

**Rings and Fields:** (12 Hrs) Definition of Field, Algebraic Extensions, Ruler Compass construction, Quotient Fields, Formal Series, Galois Theory, Ring Fields, Sub Rings, Ideal and Quotient Ring, maximal, Prime Relation, Ring Homomorphism and Isomorphism, Polynomial Rings, Euclidean Domain, Principle Ideal Domain, unique factorization domain

**Topology:** (10 Hrs) Contraction Mapping theorem, Stone Weierstrass Approximation, Dini's theorem, Riemann Lebesgue Lemma, Continuity, Arzeli Ascoli's Theorem

**Vector Calculus:** (15 Hrs) Concept of Vector, Magnitude, Direction, Algebra of Vector, Dot and Cross Product, Parametrization of Curve, Derivatives of Higher Dimension, Total Derivatives, Directional Derivatives, Partial Derivatives

**Optional Topics:** *Differential Equation, Probability Theory, Graph Theory*