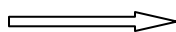


M.A/M.Sc Mathematics Semester 1st

Effective from academic session 2010



Repetition for 2012 with minor change

COMPLEX ANALYSIS-I

Course No. MM-CP-103

Unit I

Review of C-R equations and analytic functions. Complex integration, Cauchy Goursat theorem, the index of a point w.r.t. of a closed curve. Cauchy's integral formula, higher order derivatives. Morera's theorem, Cauchy's inequality and Liouville's Theorem.

Unit II

Power Series Cauchy- Hadamard formula for the radius of convergence. Taylor's Theorem, Taylor Series. Expansion of an analytic function in a power series. Laurant series and isolated singularities, poles and essential singular points. Behavior at an essential singular point, Casorati-Weirstrauss Theorem.

Unit III

Bilinear(Moebus) transformations. Their properties and classification. Fixed Points, Cross Ratio, Inverse points and Critical Points. Conformal Mapping. Mappings of (i) upper half plane on to the unit disc, (ii) unit disc on to the unit disc, (iii) left half plane on to the unit disc and (iv) circle on to a circle. The Transformations $w = \sqrt{z}$, $w = z^2$ and $w = \frac{1}{2}\left(z + \frac{1}{z}\right)$.

Unit IV

Residues: Cauchy Residues Theorem, Evaluation of Integrals by the method of Residue, Pasevals identity, Branches of many valued functions with special reference to $\arg.(Z)$, $\log (Z)$, Z^a . Infinite products, convergence and divergence of infinite products.

Recommended Books:

1. L.Ahlfors, Complex Analysis.
2. E.C.Titchmarsh , Theory of functions .
3. J.B.Conway ,Functions of a Complex Variable-1.
4. Richard Silverman, Complex Analysis.
5. H.A.Priestly, Introduction to complex Analysis.
6. Nihari Z. Conformal mappings.