M.A/M.Sc Mathematics Semester 2nd

Effective from academic session 2010 ⟹ **Repetition for 2012 with minor change**

COMPLEX ANALYSIS-II

Course No. MM-CP-203

Unit I

Maximum Modulus Principle, Schwarz Lemma and its generalization, Meromorphic function, Argument Principle, Rouche's theorem with application, Poisson integral formula for a circle and half plane, Poisson Jenson formula, Carleman's theorem, Hadmard three-circle theorem and the theorem of Borel and Caratheodory**.**

Unit II

Principle of analytic continuation, uniqueness of direct analytical continuations and uniqueness of analytic continuation along a curve. Power series method of analytic continuation, Functions with natural boundaries and related examples. Shewartz reflection principle, functions with +ive real part. Monodromy theorem.

Unit III

Space of analytic functions, Hurwitz's theorem, Montel's theorem, Riemann Mapping theorem, Weistrass factorization theorem, Gamma function and its properties, Riemann Zeta function, Reimann's functional equation. Harmonic functions on a disc, Harnack's inequlity and theorem, Drichlet's problem, Green's functions.

Unit IV

Canonical products, order of an entire functions, Exponential convergence, Borel theorem, Hadmards factorization theorem, the range of analytic function, Bloch's theorem, Schottkys theorems, the little Picard's theorem, Landau's theorem, Montel Caratheadory theorem and the Great Picard theorem. Univalent function. Bieberbach's conjecture (statement only) and the 1/4 – theorem.

Recommended Books:

1. L.Ahlfors: Complex Analysis
2. E.C. Titchmarsh : Theory of Functions
3. J.B.Conway : Functions of a complex variable –I
4. Richard's Silverman : Complex Analysis
5. A.I.Markushevish :Theory of Functions of a Complex variable
6. Nihari Z. : Conformal Mapping.
7. H.A. Priestly : Introduction to Complex Analysis.
8. S.Lang : Complex Analysis.
9. E.Hille : Analytic Function Theory (2- vol).
10. Liang –Shin Hahn, Bernard Epstein : Classical Complex Analysis.
11. D.Sarason: Complex Function Theory
12. W.H.J.Fuchs :Topics in the Theory of Functions on one Complex Variable.