

## 15 MMCC 203 Complex Analyses (3-1-0)

### Module-I (14 Hours)

The complex number system: The real numbers, The field of complex numbers, the complex plane, polar representation and roots of complex numbers, Line and half planes in the complex plane. Power series and radius of convergence, analytic function, Power series representation of analytic functions, Cauchy-Riemann equation, analytic function as mapping and its Mobius transformation.

### Module-II (14 Hours)

Complex integration: Zeros of analytic function, entire function, Liouville's theorem, fundamental theorem of algebra, maximum modulus theorem, Index of a closed curve, Cauchy's theorem and Cauchy's integral formula, Morera's theorem.

### Module-III (12Hours)

Classification of singularity, Poles, absolute convergence, Laurent series development, Residue theorems, evaluation of integrals by using residue theorem, Argument principle, Rouché's theorem, Maximum Modulus theorem, Schwarz's Lemma.

### Text Book :

1. Functions of one Complex variable- J. B. Conway ( Springer Verlag , International student edition , Narosa Publishing house, Chapter-1(1.1-1.5), Chapter-3(3.1- 3.3), Chapter-4(4.2 - 4.5), Chapter-5(5.1-5.3) , Chapter-6(6.1 - 6.2).

### Reference Books:

1. A Text book of Complex variable: by M.L Khanna (Meerut Publication)
2. Complex Analysis by Ahlfors, TMH.
3. Complex Variable; Theory & Application : Kasana , PHI