

Subject Code: 1SC2040201	Subject Title: COMPLEX ANALYSIS-II
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Course Objective:

This is an introductory course in complex analysis which provide a working knowledge of the basic definitions and theorems of Cauchy's theorem and Cauchy's integral formula and know the Meromorphic functions, Schwarz lemma and its application and Riemann's theorem on removable singularity and Comparison of entire functions and polynomials with respect to singularity.

Teaching scheme (hours) per week		Credit			Theory Marks		Practical Marks		Total
Lecture	Tutorial	Theory	Practical	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
4	1	5	-	5	60	40	--	--	100

Subject Contents			
Unit. No	Topic	Total Hours	Weight (%)
1	The index of a close curve, behavior of the index on the components, different versions of Cauchy's theorem and Cauchy's integral formula, Morera's theorem, analogy between entire function and polynomials, open mapping theorem.	18	25
2	Counting zeroes, Meromorphic functions, the argument principle, Rouché's theorem and its application, maximum principle, Schwarz lemma and its application, convex functions, Hadamard's theorem.	18	25
3	Spaces of continuous functions $C(G, \omega)$, topology of uniform convergence on compact sets, space of analytic functions, Arzela-Ascoli theorem, Montel's theorem, Hurwitz's theorem, Riemann mapping theorem. Behavior of the function and Riemann's theorem on removable singularity, Casorati-Weierstrass theorem.	18	25
4	Comparison of entire functions and polynomials with respect to singularity, analytic continuation. Poisson's integral formula on a circle, Luca's theorem, Parseval's identity, Weierstrass factorization theorem, Genus and order of entire functions, Walli's formula, Jensen's inequality, Poisson-Jenson's inequality, Runge's theorem, harmonic functions.	18	25

Course Outcome:

On successful completion of the course, students should be able to

- Develop facility with The index of a close curve, behavior of the index on the components.
- Set up and directly Rouché's theorem and its application,
- Identify and classify Comparison of entire functions and polynomials with respect to singularity.

List of References:

- J. B. Conway - Functions of one complex variable, Springer Verlag.
- W. Rudin, Real and Complex Analysis, McGraw Hill, 1967.