



Course No.	Course Title	No. of Units			Pre-requisites
		Th.	Pr.	Credit	
MATH 413	Complex Analysis	3	-	3	MATH 312

Course Objectives:

- Know the basic need to define complex number system and its relation with real number system.
- Recognize the importance and usefulness of complex analysis .
- Extend some concepts studied in Math 311 and 312 and Calculus course.
- Understand the concept of analytic functions, and their relation with Cauchy-Riemann differential equations.
- Understand the concept of complex integration.
- Be able to apply theorems and facts on analytic functions to complex integration.
- Understand the concept of Laurent's series.
- Understand and apply theorems and facts on Residues.

Course Description:

Complex numbers, complex valued functions, limit of complex valued functions, continuity, derivatives, Cauchy-Riemann equations, sufficient conditions for differentiability. Analytic functions, contours, contour integrals, antiderivatives, Cauchy-Goursat theorem, Cauchy integral formula, Liouville's theorem, convergence of complex sequences and series, Taylor's and Laurent's series and calculus of residues.

Main text book:

- Complex Variables and Applications, by R.V. Churchill and J. W. Brown, McGraw-Hill 2004.

Subsidiary books:

- Basic Complex Analysis, by J. E. Marsden and M. J. Hoffman, 2nd edition, W. H. Freeman and Company, New York, 1987.
- Invitation to Complex Analysis, by R .P. Boas and H. P. Boas, 2nd revised edition, Mathematical Association of America 2010.