2009. 4. D.M. Burton, A First Course in rings and ideals, Addison-Wesley, 1970.
5. C. Musili, Introduction to Rings and Modules, Narosa Publishing House, 2001.

Code:MAT5202: Complex Analysis Prerequisites: fundamental Ideas and theorems about Complex plane power series residues	L	T	P	Credit
	4	1	0	4

Course Category	Core
Course Type	Theory
Course Objective	The objective of this course is to introduce the fundamental ideas of the functions of complex variables and developing a clear understanding of the fundamental concepts of Complex Analysis such as analytic functions, complex integrals and a range of skills which will allow students to work effectively with the concepts.

Course Outcome(s)	Represent complex numbers algebraically and geometrically, Define and analyze limits and continuity for complex functions as well as consequences of continuity, Apply the concept and consequences of analyticity and the Cauchy-Riemann equations and of results on Harmonic and entire functions including the fundamental theorem of algebra. Analyze sequences and series of analytic functions and types of convergence, Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral. Theorem in its various versions, and the Cauchy integral formula, and Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and Evaluate complex integrals using the residue theorem.

Syllabus:

Conformal mapping, Linear transformations, cross ratio, symmetry, oriented circles, families of circles, use of level curves, elementary mappings and Riemann surfaces.

Complex integration, rectifiable curves, Cauchy's integral theorems for rectangle and disc, Cauchy's integral formula, higher derivatives. Local properties of analytic functions, removable singularities, Taylors theorem, Taylor series and Laurent series, zeroes and poles, local mapping, the maximum principle. Chains and cycles, simple connectivity, locally exact differentials, multiply connected regions, residue theorem, argument principle, evaluation of definite integrals

Harmonic functions, mean value property, Poissons formula, Schwarz theorem, reflection principle, Weierstrass theorem.

Text books:

1. L.V. Ahlfors, Complex Analysis, Third Edition Mc-Graw Hill International, 1979. 2. H. A. Priestley, Introduction to Complex Analysis, Oxford University Press, 2003.

References:

1. John M. Howie, Complex Analysis, Springer Science & Business Media, 2003. 2. John B. Conway, Functions of One Complex Variable I, Springer Science & Business Media, 1978.

3. J. Brown and R. Churchill, Complex Variables and Applications, McGraw-Hill Education, 2013.
4. V. Karunakaran, Complex Analysis, CRC Press, 2005.
5. Dennis G. Zill, Patrick Shanahan, Patrick D. Shanahan, A First Course in Complex Analysis with Applications, Jones & Bartlett Learning, 2006.

Code:MAT5203: Measure and Integration	L	T	P	Credit