1.	Title of the course	Complex Variables
2.	Course number	MA202L
3.	Structure of credits	3-0-0-3
4.	Offered to	UG
5.	New course/modification to	Modification To MA2022/7
6.	To be offered by	Department of Mathematics and Statistics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To introduce the basics concepts on complex valued functions like continuity, differentiability and analyticity. To introduce proof and theorems on complex integral, series of complex functions and analytic functions. To classify singularities of complex valued functions. Further, to introduce elementary properties of elementary functions.	
10.	**Course Content:** Analytic functions: Limits and continuity, differentiability and analyticity, analytic branches of inverse of functions, branches of logarithm, CauchyRiemann equations, harmonic conjugates. Complex integral: Cauchy's theorem and integral formula, series of complex functions and the Weierstrass M-test, Taylor series, identity theorem, isolation of zeros of an analytic function, statements of open mapping, inverse function, Liouville theorem, fundamental theorem of Algebra. Residue Calculus: Singularities and their classification, Laurent series, residue theorem and argument principle, computing real integrals using residues. Bilinear transformation, conformal mapping, elementary properties of the mapping of exponential, sine and cosine functions.	
11.	**Textbook(s):** 1. Kreyzig E, *Advanced Engineering Mathematics*, John Wiley & Sons (2010).	
12.	**Reference(s):** 1. Churchill R V, and Brown J W, *Complex Variables and Applications*, Mc-Graw Hill (1990). 2. Ponnusamy S, and Silverman H, *Complex Variables with Applications*, Birkhauser (2006).	