1.	Title of the course	Advanced Analysis
2.	Course number	MA701L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To MA7021/5
6.	To be offered by	Department of Mathematics and Statistics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** The main objectives of the course are to strengthen the basic understanding on complex and functional analysis and also to introduce advanced level topics in these areas. The students will be facilitated to learn some applications of those advanced level topics.	
10.	**Course Content:** Review of Normed Linear Spaces and Banach Spaces, Continuous linear functional, Dual Spaces and Hahn-Banach Theorems. Application of Baire's Category theorem: Uniform Boundedness Principle, Open mapping theorem and Closed Graph Theorem. Review of Hilbert Spaces, Orthogonally, Orthonormal bases, Riesz Lemma. Bounded Operators: Adjoint, Normal, Self-Adjoint, Unitary, Compact and Projection operators. Unbounded operators, Weak and Weak* Convergence. Complex Analysis: Review of Cauchy-Riemann equation and holomorphic functions. Basic properties of holomorphic functions, open mapping theorem, maximum modulus theorem, zeros of holomorphic functions, Schwarz Lemma, Riemann mapping theorem, Weierstrass factorisation theorem, meromorphic functions, essential singularities and Picard's theorem.	
11.	**Textbook(s):** 1. Kreyszig E, *Introductory Functional Analysis with Applications*, Wiley (1989). 2. Greene R E, *Krantz S G, Function Theory of one Complex Variable*, AMS (2006).	
12.	**Reference(s):** 1. Limaye B V, *Functional Analysis*, New Age International Publishers (2017). 2. Stein E M, and Shakarchi R, *Complex Analysis,* Princeton University Press (2003). 3. Ponnusamy S, and Silverman H, *Complex Variables with Applications, Birkhauser*, Boston (2006). 4. Walter Rudin, *Real and Complex Analysis*, Mc-Graw Hill Book Company (1987).	