1.	Title of the course	Numerical Analysis
2.	Course number	MA604M
3.	Structure of credits	2-0-3-4
4.	Offered to	PG
5.	New course/modification to	Modification To MA6204/10
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 approximate techniques to solve non-linear equations and a few well-known ordinary and partial differential equations. To show different methods to find the solution of a large linear system. To demonstrate methods of interpolation and different ways to compute approximation of an integral.	
10.	**Course Content:** Numerical solutions of nonlinear equations, bisection, Newton-Raphson, secant, fixed point iteration methods; Numerical linear algebra; direct and iterative methods, eigen value problems, power method; interpolations, polynomial, divided differences, Hermite and spline interpolations; Numerical integration, Newton-Cotes, trapezoidal, Simpson rules, quadrature methods, Romberg integration; Numerical differentiation, Taylor-series, Runge-Kutta, multi-step methods; Boundary value problems, shooting methods, finite difference methods, order, consistency and convergence analysis.	
11.	**Textbook(s):** 1. Butcher J C, *The numerical analysis of ordinary differential equations: Runge-Kutta and General Linear Methods*, Wiley-Blackwell (1987). 2. Kincaid D and Cheney W, *Numerical Analysis: Mathematics of Scientific Computing*, Brookes/Cole Publishing Company (1999).	
12.	**Reference(s):** 1. Atkinson K E, *An Introduction to Numerical Analysis*, John Wiley & Sons, India (1989). 2. Iserles A, *A First Course in the Numerical Analysis of Differential Equations*, Cambridge University Press (1996). 3. Lambert J D, *Computational Methods in Ordinary Differential Equations*, John Wiley & Sons, India (1974). 4. Trefethen L N and Bau D, *Numerical Linear Algebra*, SIAM (1997).	