

1.	Title of the Course	Numerical Analysis
2.	Course Number	MA6204
3.	Status of the Course	Core
4.	Structure of Credits	2-0-3-4
5.	Offered To	PG
6.	New Course/Modification to	Modification To MA6204
7.	To be Offered by	Department of Mathematics
8.	To take effect from	July 2019
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: 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.	
12.	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.	
13.	Text book(s): 1. Butcher J C, <i>The numerical analysis of ordinary differential equations: Runge-Kutta and General Linear Methods</i> , Wiley-Blackwell (1987). 2. Kincaid D and Cheney W, <i>Numerical Analysis: Mathematics of Scientific Computing</i> , Brookes/Cole Publishing Company (1999).	
14.	Reference(s): 1. Atkinson K E, <i>An Introduction to Numerical Analysis</i> , John Wiley & Sons, India (1989). 2. Iserles A, <i>A First Course in the Numerical Analysis of Differential Equations</i> , Cambridge University Press (1996). 3. Lambert J D, <i>Computational Methods in Ordinary Differential Equations</i> , John Wiley & Sons, India (1974). 4. Trefethen L N and Bau D, <i>Numerical Linear Algebra</i> , SIAM (1997).	