

## BSMS-Mathematics

Semester VII						
S.No	Course Code	Course Name	L	T	P	C
1	MA 404	<u>Numerical Analysis</u>	2	1	0	6
2		Program Elective-IV				6
3		Program Elective-V				3
4		Institute Elective – I	2	1	0	6
5		HSS Elective-II	3	0	0	6
		Total Credits				27

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1	<b>Title of the course</b> (L-T-P-C)	<b>Numerical Analysis</b> <b>(2-1-0-6)</b>
2	<b>Pre-requisite courses(s)</b>	Calculus 1 and 2, Linear Algebra, DE 1, Ordinary Differential Equations or Instructor's consent
3	<b>Course content</b>	Linear Systems of Equation, LU decomposition, Classical iterative techniques and ill conditioned systems  Matrix eigenvalue problems, Power iteration, Jacobi and QR methods  Approximation theory, interpolation (Lagrange, Hermite and piecewise interpolation) and best approximations in inner product spaces  Nonlinear Equations and their iterative solution Numerical Integration, interpolatory quadratures, Gauss quadrature, quadrature of periodic functions and Romberg integration  Finite Difference methods, convergence, stability and consistency, Lax equivalence theorem
4	<b>Texts/References</b>	Rainer Kress, Numerical Analysis, 1 <sup>st</sup> Edition, Springer Verlag New York, 1998  J. Stoer and R. Bulirsch, Introduction to Numerical Analysis, 3 <sup>rd</sup> Edition, Springer-Verlag New York, 2002 K. Atkinson and Weimin Han, Theoretical Numerical Analysis, A functional Analysis framework, 3 <sup>rd</sup> Edition, Springer-Verlag New York, 2001  P. Deuffhard and A Hohmann, Numerical Analysis in modern scientific computing, An introduction, 2 <sup>nd</sup> Edition, Springer-Verlag New York, 2003