

MA 203 T MATHAMETICS-III (SPT)										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs./Week	Theory		Internal Assessment	Term Work	Practical/Viva	Total Marks
					ES (3.0Hrs)	MS (2.0Hrs)				
3	1	---	7	4	60	30	10	---	---	100

UNIT 1 **9**

Matrix Theory: Orthogonal, Hermitian and Unitary matrices, Elementary row and column transformations, Rank and consistency conditions and solution of simultaneous equations, linear dependence and independence of vectors, Linear and orthogonal transformations. Eigen values and Eigen vectors, Properties of Eigen values, Cayley-Hamilton theorem, Reduction to normal forms, Quadratic forms, Reduction of quadratic forms to canonical forms, Index, Signature, Matrix calculus & its applications in solving differential equations.

UNIT 2 **13**

Special functions: Power series method to solve the equation, Frobenius method for solution near regular singular points, Legendre's equation, Legendre polynomials, Rodrigues's formula, Bessel's equation - Recurrence Relations and Generating functions.

UNIT 3 **9**

Curve Fitting: Principle of Least Squares, Fitting a Straight line and other curves for a given set of data points. (i.e. Least square approximation method, Linear curve, Quadratic curve, Exponential curve, Formation of Normal equations for different curves)

UNIT 4 **14**

Partial Differential Equations and its Applications: Classification of partial differential equations, solutions of one dimensional wave equation, one dimensional unsteady heat flow equation and two dimensional steady heat flow equation in Cartesian and polar coordinates by variable separable method with reference to Fourier trigonometric series and by Laplace transform technique.

APPROXIMATE TOTAL 45 Hours

Texts and References

1. R. K. Jain & S. R. K. Iyengar, Higher Engineering Mathematics, 3rd Ed., Narosa (2007).
2. E. Kreyszig, Advanced Engineering Mathematics, 8th Ed., John Wiley (1999).
3. M.D. Raisinghania, Ordinary and Partial Differential Equations, 8th Ed., S. Chand Publication (2010).
4. H. Anton, Elementary Linear Algebra with Applications, 8th Ed., John Wiley (1995).
5. G. Strang, Linear Algebra and its Applications, 4th Ed., Thomson (2006).