Shri G.S Institute of Technology and Science

Department of Applied Mathematics and Computational Science

B.E. I Year MA 10001: MATHEMATICS-I

Total No. of Units: 5 **Total No. of Lectures:** 40

LECTURE PLAN

S.No.	Topic	No. of Lectures
	UNIT 1	
1	Partial derivatives: Definition, Euler's theorem of homogeneous function.	02
2	Differentiation of implicit function, Total differential coefficients.	02
3	Jacobians.	01
4	Expansion of functions by Taylor's and Maclaurin's series of one and twovariables.	03
	UNIT 2	
5	axima and Minima of functions of two variables.	02
6	Lagrange's method of undetermined multipliers and their applications.	02
7	symptotes (Cartesian coordinates).	01
8	Curvature in Cartesian and polar coordinates.	03
	UNIT 3	
9	Detailed study of tracing of curves with examples.	03
10	Area and Length of curve with examples.	02
11	Volume and Surface of revolution with examples.	03
	UNIT 4	
12	Beta and Gamma functions and related examples.	03
13	Elementary ideas of multiple integrals and Change of order of integration with examples	03
14	Change of variables in double integrals using Jacobians with examples.	02
	UNIT 5	
15	Laws of Boolean algebra.	01
16	Boolean function and Boolean expression.	03
17	Principle of Duality, Representation of Boolean function and Sum of product function.	02
18	Application of Boolean algebra in design of switching circuits.	02

Shri G.S Institute of Technology and Science
Department of Applied Mathematics and Computational Science
B.E. I Year MA 10501: MATHEMATICS - II

Total No. of Units: 5 **Total No. of Lectures:** 40

LECTURE PLAN

S.No.	Topic	No. of Lectures
	UNIT 1	
1.	Review of matrices, elementary operation on rows and columns, inverse of matrix.	01
2.	Normal forms, Linear dependence, Rank.	02
3.	Application to theory of solutions of system of linear equations, linear transformation.	02
4.	Orthogonal, Unitary and Hermitian matrices. Characteristic equation. Eigen values and Eigen vectors, Cayley-Hamilton theorem.	03
	UNIT 2	
5.	Formation of differential equations.	01
6.	Differential equations of first order and first degree (Variable separable and Homogeneous).	02
7.	Differential equations of first order and first degree (Linear and Exact).	03
8.	Linear differential equations with constant coefficients.	02
	UNIT 3	
9.	Linear differential equations with variable coefficients.	02
10.	Simultaneous differential equations.	02
11.	Method of variation of parameters.	02
12.	Application to simple problems.	02
	UNIT 4	
13.	Binomial distributions and their Mean and Variance.	02
14.	Poisson distributions and their Mean and Variance	02
15.	Normal distributions and their Mean and Variance	02
16.	Methods of least squares and curve fitting.	02
	UNIT 5	
17.	Algebra of complex numbers, Exponential function of a complex variable.	02
18.	Circular function of a complex variable, Hyperbolic function.	02
19.	Inverse hyperbolic functions and Logarithmic function of complex variable.	02
20.	Summation of series by C + iS method.	02