



Department of Mathematics,
Udai Pratap College, Varanasi

MATHEMATICS MINOR

Programme/Class: P.G.	Year: First	Semester: I/II
Subject: Mathematics		
Course Code: MAT 100M	Course Title: Mathematics Minor	
Course outcomes : CO 1: The main objective of this course is to introduce students to basic concepts of matrices and determinants. CO 2: Students will be able to discuss the limits, continuity and differentiability of function of one variable. CO 3: Students will be able to integrate various types of functions by use of substitution, partial fractions and integration by parts method. CO 4: After completion of the course, students will be able to solve system of linear equations using matrices and determinants. CO5: Students will be able to construct ordinary differential equation and solve them by several basic methods.		
Credits: 4	Minor Elective	
Max. Marks: 25+75	Min. Passing Marks:	
Total No. of Lectures-Tutorials-Practical (in hours per week): 4-0-0		
Unit	Topic	No of lectures
I	Matrices: definition and examples, Types of matrices, symmetric and skew symmetric matrices, Idempotent Matrix, Nilpotent Matrix, Involutory Matrix, Determinant of a square matrix (up to 3 x 3 matrices), properties of determinants, minors, co-factors, Adjoint and inverse of a matrix, Rank of Matrix, Solving system of linear equation in two and three variables.	15
II	Definition of limit, Continuity and differentiability, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial, basic trigonometric functions, logarithmic and exponential functions, Derivative of composite functions, chain rule, Second order derivatives, increasing/decreasing functions, tangents and normals, maxima and minima.	15
III	Integration as an inverse process of differentiation. Integration of functions by substitution, partial fractions and parts, Definite integrals as a limit of a sum, Fundamental Theorem of Calculus, Basic properties of definite integrals and evaluation of definite integrals.	15
IV	Differential Equation: Definition, order and degree, general and particular solutions, Formation of differential equation whose general solution is given, Solution of differential equations: method of separation of variables, homogeneous differential equations of first order and first degree, linear differential equation of first order and first degree, Exact Differential Equation.	15
Suggested Readings: 1. Mathematics Textbook for Class XI, NCERT Publications 2. Mathematics Part I - Textbook for Class XII, NCERT Publication 3. Mathematics Part II - Textbook for Class XII, NCERT Publication		