

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Dinesh Rani Bansal

Subject: Mathematics

Class: B.A./B.Sc. 1st Sem

Paper: Functions & Algebra

1st week	Relations, Functions along with domain and range, Composition of functions
2nd week	Invertibility and inverse of functions, One-to-one correspondence and the cardinality of a set.
3rd week	Relations between the roots and coefficients of general polynomial equation in one variable.
4th week	Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. Class Test -1
5th week	Transformation of equations. Nature of the roots of an equation Descarte's rule of signs.
6th week	Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions.
7th week	Matrix and its types. Symmetric, Skew-symmetric, Hermitian and Skew Hermitian matrices. Assignment-1.
8th week	Unitary and Orthogonal Matrices, Idempotent, Involuntary, Nilpotent Matrices.
9th week	Rank of a Matrix & its applications. Rank of a matrices, Row rank and column rank of a matrix
10th week	Elementary Operations on matrices, Inverse of a matrix , Normal Form, PAQ Form Assignment -2
11th week	Linear dependence and independence of rows and columns of matrices
12th week	Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations, Theorems on consistency of a system of linear equations.
13th week	Cayley Hamilton theorem. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Class Test -2
14th week	Minimal polynomial of a matrix. Derogatory and Non- derogatory Matrices
15th week	Some important theorems on eigen values
16th week	Diagonalization of matrix.
17th week	Test and Revision
18th week	Test and Revision

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Dinesh Rani Bansal

Subject: Mathematics (Minor)

Class: B.A./B.Sc. 1st Sem

Paper: Basic Mathematics

1st week	Definition and type of matrices;
2nd week	Algebra of Matrices
3rd week	Assignment-1 Properties of determinants; Calculation of values of determinants up to third order
4th week	Adjoint of a matrix, Inverse of a matrix through adjoint and elementary row or column operations
5th week	Solution of system of linear equations having unique solution and involving not more than three variables
6th week	Class Test –1 General rules of Differentiation, Differentiation of product and quotient of two functions
7th week	Chain Rule, Differentiation of Logarithmic and Exponential Functions
8th week	Differentiation of implicit functions and parametric functions
9th week	Derivative of higher order Assignment-2
10th week	Partial derivatives up to second order; Homogeneity of functions and Euler's theorem
11th week	Total differentials, Differentiation of implicit function with the help of total differentials
12th week	Maxima and Minima; Cases of one variable involving second or higher order derivatives; Cases of two variables involving not more than one constraint
13th week	Integration as anti-derivative process, Standard forms
14th week	Methods of integration by substitution, by parts and by use of partial fractions
15th week	Definite integration, Finding areas in simple cases
16th week	Consumers and producers surplus, Nature of Commodities learning Curve, Leontiff Input-Output Model
17th week	Class Test – 2 and Revision
18th week	Revision

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Dinesh Rani Bansal

Subject: Mathematics (MDC)

Class: B.A./B.Sc./B.Com 3rd Sem

Paper: Applicable Mathematics

1st week	Meaning, elements, types, presentation and equality of Sets
2nd week	Union, Intersection, Complement and Difference of Sets, Venn Diagram
3rd week	Cartesian Product of two Sets, Applications of Set Theory
4th week	Assignment-1 Definition and Types of Matrices
5th week	Algebra of Matrices, Properties of determinants
6th week	Calculation of values of Determinants upto third order, Adjoint of a Matrix
7th week	elementary row and column operations; Finding inverse matrix through adjoint Group Discussion -1
8th week	Solution of a system of Linear equations having unique solution and involving not more than three variables.
9th week	Revision and Class Test - 1
10th week	Determination of compound interest when compounded annually, half yearly, quarterly etc.
11th week	Determination of principal, rate and time Seminar
12th week	Continuous compounding of interest and effective rate
13th week	Problems on depreciation and population Assignment-2
14th week	Types of annuity and Amount of annuity
15th week	Present value of different types of annuity
16th week	Practical problems related to annuity Class Test -2
17th week	Group discussion – 2 and Revision
18th week	Revision

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Dinesh Rani Bansal

Subject: Mathematics

Class: B.A./B.Sc. 5th Sem

Paper: Real Analysis

1st week	Definition and type of Riemann integration, Darboux Theorem
2nd week	Integrability of continuous and monotonic functions
3rd week	Integrability as a limit of sum
4th week	The Fundamental theorem and Mean value theorems of integral calculus
5th week	Assignment-1 Types of Improper integrals and their convergence
6th week	Various Comparison tests, Abel's test
7th week	Dirichlet's test, Frullani's integral
8th week	Continuity, Differentiability and integrability of an integral of a function of a parameter
9th week	Class Test- 1 Definition and examples of metric spaces, neighborhoods, limit points, interior points
10th week	Open and closed sets, closure and interior, boundary points
11th week	Subspace of a metric space, equivalent metrics, Cauchy sequences, completeness,
12th week	Cantor's intersection theorem, Baire's category theorem, Contraction Principle
13th week	Assignment- 2 Continuous functions, Uniform continuity
14th week	Compactness for metric spaces, Sequential compactness, Bolzano-Weierstrass property
15th week	Total boundedness, Finite intersection property, Continuity in relation with compactness,
16th week	Connectedness , components, continuity in relation with connectedness
17th week	Class Test – 2 and Revision
18th week	Revision

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Madhu

Subject: Mathematics

Class: B.A. /B.Sc. 5th Sem

Paper: Numerical Analysis

1st week	Finite difference operator, Forward, backward and Central difference operator, fundamental theorem of difference calculus, Shift operator and their properties and related problems.
2nd week	Effect of an error in a tabular value and Missing terms, Numerical problems related to effect of an error in a tabular value, Relation between different Finite difference operators
3rd week	Definition of interpolation and extrapolation, Difference between Interpolation with equal intervals and interpolation with unequal intervals. Newton Gregory formula for forward and backward interpolation, related problems. Test and Group Discussion.
4th week	Subdivision of interval and related problems. Divided difference and related theorems. Newton's divided difference interpolation formula for unequal intervals and related examples.
5th week	Relation between divided differences and ordinary differences and related examples. Lagrange's interpolation formula, Hermite's interpolation formula and related examples.
6th week	Definition of central difference interpolation formula. Gauss forward interpolation formula, Gauss backward interpolation formula, Sterling formula and related examples. Bessel's formula and related examples. Assignment.
7th week	Probability Distributions, Examples of probability distribution of a random variable. Mean and variance of a random variable, related problems, Binomial distribution, Mean and variance of binomial distribution, recurrence formula.
8th week	Properties of binomial distribution, fitting a binomial distribution and related problems. Poisson distribution, Mean, variance and recurrence formula of Poisson distribution, Problems related to Poisson distribution and their properties, Fitting a Poisson distribution and related properties.
9th week	Normal distribution and its properties, related problems. Method of area to find the expected frequencies for normal curve, related examples, Derivatives Using Newton's Forward and Backward Interpolation formula.
10th week	Derivatives Using Sterling and Bessel's Central Interpolation Formula and Newton's Divided Difference formula. Problems to find the different

	derivative when some tabulated table is given. Definition of Eigen values and Eigen vectors and some properties of Eigen values, Problems to find the Eigen values and their corresponding Eigen vectors of the matrix. Test and Group Discussion.
11th week	Power method and problems to find the largest Eigen value of the matrix, Jacobi's method for symmetric matrix. Given's Method and problems on how to transform a matrix into tridiagonal form by Given's method and to find the Eigen vector corresponding to the largest Eigen value from the Eigen vectors of the tridiagonal matrix.
12th week	House-Holder's method, QR method, Lanczo's method and related examples. Numerical Integration, Newton Cotes Quadrature formula and related problems, Numerical Integration by trapezoidal rule, Simpson's 1/3 rule, Simpsons 3/8 rule and related problems.
13th week	Numerical Integration by Chebychev formula and gauss quadrature formula, related problems. Ordinary differential equations, Initial and Boundary conditions, Single step and Multi step method, Euler's method and related examples. Modified Euler's Method and related examples. Assignment.
14th week	Taylor's series method and problems related to Taylor's series method. Runge-Kutta method of first, second, third and fourth order, related examples, Picard's Method and its examples.
15th week	Predictor-Corrector Methods, Milne-Simpson's method and its examples, Predictor-Corrector Methods, Milne-Simpson's method and its examples.
16th week	Adams-Bashforth Predictor Formula and Adams-Moulton Corrector Formula and its examples
17th week	Test, revision and problem discussion of whole Syllabus.
18th week	Test, revision and problem discussion of whole Syllabus.

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Madhu

Subject: Mathematics

Class: B.A. /B.Sc. 3rd Sem

Paper: Ordinary Differential Equations

1st week	Geometrical meaning of a differential equation. Exact differential equations. Solution of an exact differential equations .
2nd week	Integrating factors. Various rules for finding Integrating factors. Problems based on finding the solution of exact Differential Equations.
3rd week	First order higher degree equations solvable for x, y, p. Lagrange's equations,
4th week	Clairaut's equations. Equation reducible to Clairaut's form. Singular solutions. Test and Group Discussion.
5th week	Orthogonal trajectories: Cartesian coordinates and polar coordinates. Self orthogonal family of curves.
6th week	Linear non-homogeneous ordinary differential equations with constant coefficients. Rules for evaluating Complementary function, Particular integral and Complete solution of Linear non-homogeneous differential equations with constant coefficients.
7th week	Homogeneous linear ordinary differential equations. Equations reducible to homogeneous. Solution of homogeneous linear differential equations. Assignment.
8th week	Linear differential equations of second order, reduction to normal form. Solution of the linear differential equations of second order by removing the first derivative.
9th week	Solution of the linear differential equations of second order by changing the independent variable.
10th week	Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation.
11th week	Method of variations of parameters. Method of undetermined coefficients. Test and Group Discussion.
12th week	Ordinary simultaneous differential equations.
13th week	Solution of simultaneous differential equations involving operators $x(d/dx)$ or $t(d/dt)$ etc.
14th week	Simultaneous equation of the form $dx/P = dy/Q = dz/R$. Assignment.
15th week	Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exact.

16th week	General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant. Method of auxiliary equations
17th week	Test, revision and problem discussion of whole Syllabus.
18th week	Test, revision and problem discussion of whole Syllabus.

Name of the Teacher: Dr. Madhu

Subject: Mathematics

Class: B.A. /B.Sc. 3rd Sem

Paper: Operations Research Techniques

1st week	Definition, scope, methodology and applications of OR.
2nd week	Types of OR models. Concept of optimization. Linear Programming. Formulation of a Linear Programming Problem (LPP).
3rd week	Requirements for an LPP. Advantages and limitations of LPP. Graphical method (corner point method) for finding the solution of LPP
4th week	Graphical method (Iso Profit or Iso-cost method) for finding the solution of LPP. Multiple, unbounded and infeasible solutions of LPP . Group Discussion
5th week	Principle of simplex method: standard form, basic solution, basic feasible solution
6th week	Computational Aspect of Simplex Method: Cases of unique feasible solution, no feasible solution.
7th week	Computational Aspect of Simplex Method: multiple solution and unbounded solution and degeneracy. Class test
8th week	Two Phase and Big- M methods.
9th week	Duality in LPP, primal-dual relationship.
10th week	Transportation Problem: Methods for finding basic feasible solution of a transportation problem. Assignment
11th week	Modified distribution method for finding the optimum solution. Unbalanced and degenerate transportation problems.
12th week	Transshipment problem, maximization in a transportation problem.
13th week	Assignment Problem: Solution by Hungarian method, Unbalanced assignment problem Case study
14th week	Maximization in an assignment problem, Crew assignment and Travelling salesman problem.
15th week	Game Theory: Two person zero sum game, Game with saddle points, the rule of dominance Class test
16th week	Algebraic, graphical and linear programming methods for solving mixed strategy games.
17th week	Test, revision and problem discussion of whole Syllabus.
18th week	Test, revision and problem discussion of whole Syllabus.

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Reetu

Subject: Mathematics (MDC)

Class: B.A./B.Sc./B.Com 1st Sem

Paper: Introductory Mathematics

1st week	Numbers, H.C.F. and L.C.M. of Numbers
2nd week	Decimal and Fractions, Simplification
3rd week	Square roots and cube roots, Surds and indices
4th week	Assignment-1 Problems on numbers
5th week	Average
6th week	Percentage
7th week	Profit and Loss Group Discussion -1
8th week	Ratio and proportion
9th week	Revision and Class Test - 1
10th week	Problem on ages
11th week	Partnership Seminar
12th week	Time and work
13th week	Time and distance Assignment-2
14th week	Problems on trains
15th week	Mixture problem, Problems based on Calendar
16th week	Problems based on clock. Class Test -2
17th week	Group discussion – 2 and Revision
18th week	Revision

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Reetu

Subject: Mathematics (SEC)

Class: B.A./B.Sc. 1st Sem

Paper: Mathematical Programming in C and Numerical Methods

1st week	Solution of Algebraic and Transcendental equations by Bisection method and Regla Falsi method
2nd week	Solution of Algebraic and Transcendental equations by Newton Raphson method and Secant method
3rd week	Newton's iterative method for finding p^{th} root of a number, Order of convergence of the iterative methods
4th week	Assignment-1 Solution of Simultaneous linear algebraic equations by Gauss-elimination method and Gauss Jordan Method
5th week	Triangularization method (LU decomposition method), Cholesky Decomposition method.
6th week	Crout's method and Jacobi's method
7th week	Gauss-Seidal's method, Relaxation method.
8th week	Class Test – 1 Computers: A General Introduction, Algorithms, Flow charts
9th week	Introduction to C, Data types, Operators and expressions, Input /Output functions. Lab work: Program 1, Program 2
10th week	Decisions control structure, Implementation of Loops, Switch Statement & Case control structures Lab work: Program 3, Program 4
11th week	Functions, Preprocessors Lab work: Program 5, Program 6
12th week	Arrays Case study / Mini project
13th week	Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters Lab work: Program 7, Program 8
14th week	Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures. Lab work: Program 9, Program 10
15th week	Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions
16th week	Practical File and Class Test -2
17th week	Revision
18th week	Revision

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Reetu

Subject: Mathematics (Minor)

Class: B.A./B.Sc. 3rd Sem

Paper: Business Mathematics

1st week	Determination of compound interest compounded annually, half yearly, quarterly etc.
2nd week	Determination of principal, rate and time
3rd week	Continuous compounding of interest and effective rate
4th week	Problems on depreciation and population Assignment-1
5th week	Types of annuity and Amount of annuity
6th week	Present value of different types of annuity
7th week	Valuation of simple loans and debentures
8th week	Problems relation to sinking funds.
9th week	Class Test – 1 Formulation of Linear Programming Problem(LPP)
10th week	Graphical method of solution of LPP, Problems relating to two variables including the case of mixed constraints
11th week	LPP having no solution, multiple solutions, unbounded solution and redundant constraints.
12th week	Application of LPP in solving problems related to business and commerce
13th week	Assignment-2 Simp lex method of solving LPP
14th week	Duality and Dual Problems
15th week	Transportation Problems
16th week	Class Test -2
17th week	Revision
18th week	Revision

TEACHING PLAN

(July, 2025 to November, 2025)

Name of the Teacher: Dr. Reetu

Subject: Mathematics

Class: B.A./B.Sc. 5th Sem

Paper: Groups and Rings

1st week	Definition of a group with example and simple properties of groups
2nd week	Subgroups and Subgroup criteria, Generation of groups, cyclic groups
3rd week	Cosets, Left and right cosets, Index of a sub-group, Coset decomposition, Lagrange's theorem and its consequences
4th week	Normal subgroups, Quotient groups
5th week	Assignment-1 Homomorphisms, Isomorphisms,
6th week	Automorphisms and Inner automorphisms of a group, Automorphisms of cyclic groups
7th week	Center of a group and derived group of a group
8th week	Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem
9th week	Class Test- 1 Introduction to rings
10th week	Subrings, Integral domains and fields, Characteristics of a ring
11th week	Ideals (principal, prime and Maximal) and Quotient rings
12th week	Ring homomorphisms, Field of quotients of an integral domain.
13th week	Euclidean rings, Principal Ideal Domain(PID)
14th week	Assignment- 2 Polynomial Rings over rings, integral domain and fields
15th week	Divisibility of Polynomials over the rational field and some important theorems,
16th week	Unique factorization domain, The Eisenstein's criterion
17th week	Class Test – 2 and Revision
18th week	Revision