

LESSON PLAN (FROM JULY 2025 TO NOV. 2025)

Name: Dr. Santa Gulia

Subject: Mathematics

Class: BSc/BA - 1st year

Paper Name: Function & Analysis

Semester: 1st

1. July 15 to July 25, 2025 :- Relations, functions along with domain and range, composition of functions. Types of Relations: (i) Identity Relation, (ii) Universal Relation, (iii) Void or Empty Relation. Function of mappings, Image and Pre-Image, Equal Functions, Real Functions. Example & Exercise - 1.1.
2. July 26 to August 05, 2025 :- Invertibility and inverse of function, One to One corresponding and the cardinality of a set. Into function, Onto function, One-One function, Many-one function, One-one into function, Many-one into function. Example & Exercise - 1.2, 1.3.
3. August 06 to August 16, 2025 :- Relations b/w the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equation having conditions on roots. Theorem $f(x) = 0$ of the n th degree has n th degree. Example & Exercise - 2.1, 2.2.
4. August 17 to August 27, 2025 :- Transformation of equation. Nature of the roots of an equation, Descartes's rule of signs, Reciprocal Roots, Reciprocal Eq., Roots Diminished By a Given Number, Practical Method. Example & Exercise - 3.1.
5. August 28 to Sep. 08, 2025 :- Solution of cubic equation (Cardon's Method). Biquadratic equation & their solution. Cardon Method of Solving a Cubic equation, Roots of the cubic $z^3 + 3Hz + G = 0$. Example & Exercise - 5.1.

6. Sep. 09 to Sep. 19, 2025 :- Matrix and its type - Symmetric, Skew-symmetric, Hermitian and skew Hermitian matrices, Orthogonal matrix, Example & Exercise - 6.1, Unitary matrix, Example & Exercise - 6.2, Idempotent, Involutory and Nilpotent matrices. Assignment.
7. Sep. 20 to Sep. 30, 2025 :- Rank of a matrix and its applications, Sub matrix of a matrix, Minor of a matrix, Example & Exercise - 7.1, Elementary operations on matrices, Theorem, Equivalent matrices.
8. Oct. 01 to Oct. 10, 2025 :- Linear dependence and independence of rows and columns of matrices, Application of matrix to a system of linear (both homogeneous and non-homogeneous) eq., theorem on consistency of a system of linear equations.
9. Oct. 11 to Oct. 19, 2025 :- Eigen values, Eigen vectors and the characteristics eqⁿ of a matrix, Theorem on characteristics Roots & characteristic vectors, Examples & Exercise - 9.1.

[Diwali Break - 20 Oct. 25 - 26 Oct. 25]

10. Oct. 27 to Nov. 7, 2025 :- Minimal polynomial of a matrix, Cayley-Hamilton theorem and its use in finding the inverse of a matrix, Diagonalization of matrix.

Principal

LESSON PLAN (FROM JULY 2025 to Nov. 2025)

Institution: Dr. Santa Gulia

Class: B.Sc/BA - Ist year

Semester - Ist

Subject: Mathematics

(Minor)

Paper Name: Basic Mathematics

1. July 15 to July 25, 2025 :- Calculus (Problems and theorems involving trigonometrically ratios are not to be done. Differentiation: Partial derivatives up to second order.
2. July 26 to August 5, 2025 :- Homogeneity of functions and Euler's theorem, total differential, Differentiation of implicit function with the help of total differential. Maxima and minima.
3. August 6 to August 16, 2025 :- Maxima and minima Cases of one variable involving second or higher order derivatives. It's theorems, all of the examples with its exercises.
4. August 17 to August 27, 2025 :- Integration: as anti derivative process; standard forms, its theorems, examples and exercises. Methods of integration by substitution, by parts, and by use of partial fractions.
5. August 28 to Sep. 08, 2025 :- Definite Integration, finding area in simple cases, consumers and producers surplus.

6. Sep. 09 to Sep. 19, 2025 :- Nature of commodities learning curve ; leontiff input - output model. its rules and its problems. complete unit - Test its examples, exercise question complete.
7. Sep. 20 to Sep. 30, 2025 :- Matrices : Definition of matrix, Types of matrices (Null matrix, skew symmetric matrix, Hermitian matrix, etc.) Algebra of matrices.
8. October 1 to October 10 :- Determinants : Properties of determinants ; calculation of value of determinants up to third, its theorem, all of its example with its exercises.
9. October 11 to October 21 :- Adjoint of a matrix through adjoint and elementary row of column operations. its complete exercises and examples.

(DIWALI BREAK Oct 20, 2025 - Oct 26, 2025)

10. October 27 to November 07 :- Solution of system of linear equation, its assignments. unique solution and involving not more than three variable.

LESSON PLAN CFROM July 2025 to Nov. 2025)

Dr. Samta Gukha
BSc./BA-2nd year
Semester: 3rd.

Subject Mathematics
Paper Name O.D.E

- 1) July 15 to July 25, 2025 Chapter-1 (Introduction to diff. eqⁿ.)
Exact differential equation & Theorems, Examples, ex-1.1, Integration factor & their rules & examples, Example with ex-1.2 example with ex-1.2 examples with ex-1.3, 1.4, rules, examples with exercise 1.5, 1.6, 1.7.
- 2) July 26 to August 5, 2025 Equation solvable, Introduction Ch-2, Ex-2.1 equation solvable for Y with examples, ex-2.1, equation ex-2.1 & 2.2, Revision in equation solvable for X with example. ex-2.3, Lagrange's equation with example, Clairaut's, equation with example.
- 3) August 06 to August 16, 2025 Eq. Reducible to Clairaut's eqⁿ. with example, singular sol. & Discriminate, exercise revision, test Ch-1, Orthogonal trajectory i.e. Ch-3, Orthogonal trajectory in cartesian & polar co-ordinates with examples, Ex-3.1. Revision test Ch-2, Ch-4 (Linear coeff. eqⁿ with const. coeff.)
- 4) August 17 to August 27, 2025 Ex-4.1, complete function & particular integral with examples, ex-4.2, 4.3, 4.4, 4.5, Revision of all cases & ex-4.6, chapter-5 (Homogeneous linear eqⁿ). eqⁿ reducible to homogeneous linear form with example & ex-5.1. Revision of ex-5.1 & Test Ch-5.1, ex-5.2.
- 5) August 28 to Sep. 08, 2025 Method of finding particular integral, example solve linear diff eq. ex-6.1 example & ex-6.2, 6.3 H.W assignment, variation of parameter with example.

6. Sept. 09 to Sept 19, 2025 : $\rightarrow$ ex-4, ex-6.4 solution of diff. eqⁿ.
by method of undetermined coeffⁿ. ex-6.5, Revision 4-6, Revision
Test -6.

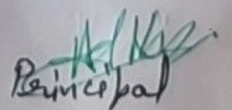
7. Sept. 20 to Sept. 30, 2025 : $\rightarrow$ Ch-7 (Introduction - ordinary simultan-
-eous diff. eqⁿ. method of solving diff eqⁿ with const. coeff.

8. October, 1 to October 10 : $\rightarrow$ Example, method of differentiation
& ex-7.1, general interpretation of eqⁿ. example practice.

9. October 11 to October 21 : $\rightarrow$ Example with ex-7.2, second
Integral example practice.

{ DIWALI BREAK. }
Oct 20, 2025 - Oct 26, 2025

10. October 27 to November 07 : $\rightarrow$ Revision, ch-8 (Total diff. eqⁿ)
method of solve eqⁿ on variable as constant out of three
Variable Test-7 & 8. revise, ex-8.1, 8.2, 8.3 with example.


Principal

LESSON PLAN (From July 2025 to Nov. 2025)

Name: Dr. Samra Gulia

Subject: Mathematics

Class: BA./Bsc. - 3rd year

Paper Name: Numerical Analysis

Semester: 5th

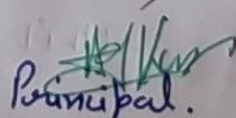
Sr. No.	Time Period	Syllabus
1)	July 15 to July 25, 2025	Define basic concepts of Maths. i.e. function, relations, term etc. finite difference operators and their relations. Finding the missing terms and effect of error in a difference tabular values. Interpolation with equal intervals: Examples & Exercises. Theorem based on Δ , e , E & its question.
2)	July 26 to August 05, 2025	Newton's forward and Newton's backward interpolation formula. Interpolation with equal intervals; Newton's divided difference. Lagrange's interpolation formula; Hermite formula. Revise chapter - I & complete Unit - I.
3)	August 06 to August 16, 2025	Test of Unit - I st, start central differences; Gauss forward and Gauss's backward interpolation formula. Sterling formula. Its theorem & based all Examples. Problems Discussion.
4)	August 17 to August 27, 2025	Bessel formula and its based all examples. Complete Exercise 4.1. Chapter - 5 Probability Distribution. Define all important terms & solve all based questions. Binomial Distribution, Recurrence formula, Ex. 5.1.
5)	August 28 to Sep. 08, 2025	Poisson Distribution & Normal Distribution. Its passed all examples and complete exercise 5.2, 5.3. Revise chapter 4 also. Complete Unit - I & II.

- 6) Sep. 09 to Sep. 19, 2025 - Chapter - 6 Numerical Differentiation Start Solve by using Newton's Forward Interpolation & backward interpolation formula, Bessel's central Difference formula. Its examples and Exercise 6.1 Complete. Problem Discuss of Unit - I, II. Make Assignment.
- 7) Sep 20 to Sep 30, 2025 - Test of Unit - 1st & 2nd, Chapter - 7 Eigen value problem start. Define all definitions Power method, Jacobi's Method. Its based all examples and exercise 7.1 (half). Given's Method, House-Holder's Method.
- 8) Oct. 01 to Oct. 10, 2025 - Complete Exercise 7.1. Unit - 3 complete Problems Discuss of Unit - 3, Chapter - 8 start Numerical Integration: Newton - Cotes's Quadrature formula, Trapezoidal rule. Simpson's $\frac{1}{3}$ & $\frac{3}{8}$ rule, Chebyshev formula, Gauss Quadrature formula.
- 9) Oct. 11 to Oct. 19, 2025 - Solve all examples related above method Chapter - 8 complete. Chapter 9. Numerical Solⁿ of ODE Single Step - Method - Picard's Method, Taylor's series method. Euler's method, Runge-Kutta Method, Multiple Step Method. etc. solved its examples & exercises.

{ DIWALI BREAK. }

Oct. 20, 2025 - Oct. 26, 2025

- 10) Oct. 27 to Nov. 7, 2025 - Problem discuss on ch-7 & 8. Unit - 4 Complete. Revision & Test Unit - 3 & 4 also. Quiz competition of Maths (Basic). Tentative lectures plan.


Principal.

Govt. College, Badli