

## Lesson Plan of Session: 2025-26

Name of Teacher: Dr. Niketa Sharma

Subject: Mathematics

Class: B.A. Mathematics Hons. 6<sup>th</sup> sem

Paper: Basic Mathematical Techniques

S. No.	Month	Topic/Chapter to be covered	Topic of Assignment	Topic of Presentation	Topic of Quiz	Topic of Class Test
1	January	Definition of Eigenvalue and Eigenvector, Geometric and algebraic multiplicity				
2	February	Characteristic equation and matrix, Basic algorithm of Power Method Convergence criteria Inverse Power Method, Shifted Power Method				
3	March	Techniques for solving algebraic and transcendental equation: Newton-Rapson, Chebyshev, derivative free, iterative, Bairstow, Numerical techniques for solving ODEs: Euler methods, Runge-Kutta methods (2 <sup>nd</sup> and 4 <sup>th</sup> order)	Taylor series and Runge-Kutta method	Eigenvalue and Eigenvector		
4	April	Nostrum method, Adams-Bashforth method, Taylor series method, Statistical hypothesis test, T-test for one and two samples, F-test, Chi-square test, Statistical methods for data fitting: Linear, multi-linear, non-linear regression			Chi-square test	F-Test
5	May	Revision				

## Lesson Plan of Session: 2025-26

Name of the Teacher: Dr. Niketa Sharma  
Class: M.sc Mathematics semester 2<sup>nd</sup>

Subject: Mathematics  
Paper: Practical-2

S. No.	Month	Topic/Chapter to be covered	Topic of Assignment	Topic of Presentation	Topic of Quiz	Topic of Class Test
1	January	Given a function $f(x) = \sin(x)$ , write a MATLAB script that computes the Taylor series expansion of the function around a point $x_0$ upto the $n$ terms. Evaluate the Taylor series at a set of points. Plot the original function & its Taylor series approximation on the same graph for comparison.				
2	February	For a given square matrix $A$ , find the eigen values & eigen vectors & check the result with built-in-function. Find the inverse of a given matrix and verify the result by using built-in-function.				
3	March	Given Matrix $A$ of order $4 \times 3$ plot the bar diagram corresponding to matrix $A$ for the following cases: Display 4 groups of three bars, different bar corresponding to each entry of row in a group. Display one bar for each row of the matrix. The height of each bar is the sum of the elements in the row. Given the three vectors $x, y, z$ . Represent the data $Y$ versus $X$ and $Z$ versus $X$ in one graph but using the following routines		Run programme 18		
4	April	For given matrices $X, Y, Z$ and demonstrate Plot 3 contour surf. Represent the data given by vector $x$ by using following: Bar chart, pie chart, plot, Histogram chart & scatter chart using polar coordinates.	Run programme 19			
5	May	Revision				

## Lesson Plan of Session: 2025-26

Name of the Teacher: Dr.Niketa Sharma  
Class: B.A. Mathematics Hons. 2<sup>nd</sup>semester

Subject: Mathematics  
Paper: Programming in C

S. No.	Month	Topic/Chapter to be covered	Topic of Assignment	Topic of Presentation	Topic of Quiz	Topic of Class Test
1	January	Computers, Introduction to C				
2	February	Data types, operators and expressions		Data types		
3	March	Decision control structures, loops, functions, C pre-processor	Loops		Function	
4	April	Arrays, structures and unions, pointers, files in C, Solution of algebraic and transcendental equations, simultaneous linear algebraic equations				Arrays
5	May	Revision				

## Lesson Plan of Session: 2025-26

Name of the teacher: Dr. Niketa Sharma

Class: B.A/B.Sc. /B.A. Mathematics Hons. 6th semester

Subject: Mathematics

Paper: Numerical Analysis

S. No.	Month	Topic/Chapter to be covered	Topic of Assignment	Topic of Presentation	Topic of Quiz	Topic of Class Test
1	January	Round off error and computer arithmetic, Local and global truncation errors. Algorithms and convergence.				
2	February	Bisection method, False position method, Fix point iteration method, Newton-Raphson method and Secant method, Gauss-elimination method, Gauss-Jordan method, Triangularization Method, Crout's method, Gauss-Seidel method.		Gauss-Jordan method	Newton-Raphson method	
3	March	Gregory-Newton forward and backward difference interpolations, Newton's divided difference formulae, Lagrange's Interpolation Formulae, Central Differences.	Sterling formula, Bessel's formula			
4	April	Numerical integration, Numerical solution of ODE, Multiple step methods, Predictor-corrector method, Modified Euler's method, Milne-Simpson's method.				Central differences
5	May	Revision				

### Lesson Plan of Session: 2025-26

Name of the Teacher: Dr. Niketa Sharma  
Class: B.C.A. 2<sup>nd</sup> semester

Subject: Mathematics  
Paper: Advance Discrete Structure

S.No.	Month	Topic/Chapter to be covered	Topic of Assignment	Topic of Presentation	Topic of Quiz	Topic of Class Test
1	January	Propositions & Truth Tables				
2	February	Logic & Propositional Calculus, Algebra of Proposition		Propositions, Logic		
3	March	Set Theory, Duality, Counting Principles, Partitions, Power Sets	Set Theory, Power Sets		Set Theory	
4	April	Boolean Algebra, Lattices, Relations				Boolean Algebra
5	May	Revision				