Government College for Women, Hisar

Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-I/B.Com-I	**Semester : I**
Subject : Mathematics for Everyday Life	**Paper Code: C24MDC119T**
External Marks: 50	**Total Marks: 75**
Internal Marks: 25	**Teacher Name : Mr. Anil Budania**

Month	Topics
July 2025	**UNIT-I** Number system, LCM and HCF of numbers, decimal fractions
August 2025	Square and cube roots. Average, Problems on Numbers, problems on Ages, Surds and Indices, Arithmetic progression and Geometric progression with their simple and basic practical applications, Number series completion.
September 2025	**Unit - II** Percentage, Profit and Loss, Ratio, Proportion and Variation, Partnership, Problems based on the topics of Calendar and Clocks, Average, Average speed problems
October 2025	**Unit - III** Time and Work, Time and Distance, Area and perimeter of triangles and circle, Area and perimeter of quadrilaterals (Square, Rectangle, Parallelogram, Rhombus, Trapezium)
November 2025	Volume and surface area of Cube, Cuboid, Cylinder, Sphere.

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Government College for Women, Hisar

Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-II/B.Com-II	**Semester : III**
Subject : Application of Mathematical Statistics in daily life	**Paper Code: C24MDC319T**
External Marks: 50	**Total Marks: 75**
Internal Marks: 25	**Teacher Name : Mr. Anil Budania**
Month	**Topics**
July 2025	**Internship Training**
August 2025	**Unit-I Introduction to Statistics:**-Definition and Importance, Applications of Statistics in Real Life (e.g., business, health, sports, education) **Types of Data**: Qualitative vs. Quantitative Data, Discrete vs. continuous Data, Primary and Secondary Data, **Organizing Data:** Frequency Distribution Tables,Grouped and ungrouped Data.
September 2025	**Unit-II Measures of Central Tendency:**-**Mean** (Arithmetic Average): Calculation for Ungrouped and Grouped Data,**Median:** Finding the Middle Value for Ungrouped and Grouped Data, **Mode**: Identifying the Most Frequent Value
October 2025	**Unit-III Measures of Dispersion**:- **Range** -Definition and Calculation, Variance and Standard Deviation- Concept and Basic Calculation for Ungrouped Data
November 2025	**Interquartile Range (IQR)**- Understanding Quartiles and Spread of Data

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : B.Com-I	**Semester : I**
Subject : Business Mathematics	**Paper Code: C24MIC103T(i)**
External Marks: 35	**Total Marks: 50**
Internal Marks: 15	**Teacher Name : Mr. Anil Budania**
Month	**Topics**
July 2025	**Unit**-I Logarithms: Definition, Laws, Common Logarithms, Parts of common logarithms – Characteristics, Mantissa
August 2025	Anti-logarithms: Method of finding anti-logarithm. Annuity, Compound Interest.
September 2025	**Unit-II** Sequence and Series: Arithmetical Progression – General term, Sum of finite numbers, Arithmetic mean; Geometrical Progression - n th term of G.P
October 2025	Sum of first n terms, Sum to infinity, Geometric mean. Matrices: Definition of matrices; Types of matrices; Algebra of matrices.
November 2025	Determinants: Properties of determinants.

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-I/B.Sc-I(LS)	**Semester : I**
Subject : Sets and Sequences	**Paper Code: C24MIC115T**
External Marks: 35	**Total Marks: 50**
Internal Marks: 15	**Teacher Name : Mr. Anil Budania**
Month	**Topics**
July 2025	UNIT-I Sets and their representations, Empty set, Finite and infinite sets
August 2025	Subsets, Equal sets, Power sets, Universal set, Union and intersection of sets, Difference of two sets
September 2025	Complement of a set, Venn diagram, De-Morgan's laws and their applications.
October 2025	Unit-II Arithmetic progression, Geometric progression, Harmonic progression, Arithmetic mean (A.M.)
November 2025	Geometric mean (G.M.), Harmonic mean (H.M.), Relation between A.M., G.M. and H.M.

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-II/B.Sc-II(PS)	**Semester : III**
Subject : Special Functions and Transform Techniques	**Paper Code: C24SEC329T(i)**
External Marks: 35	**Total Marks: 50**
Internal Marks: 15	**Teacher Name : Mr. Anil Budania**
Month	**Topics**
July 2025	Internship Training
August 2025	**Unit -I** Series solution of differential equations – Power Series Method
September 2025	Bessel, Legendre and Hermite differentials equations and their solutions..
October 2025	**Unit-II** Laplace Transforms –Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals,
November 2025	Differentiation and integration of Laplace transforms.

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-II/B.Sc-II(PS)	**Semester : III**
Subject : Special Functions and Transform Techniques Lab	**Paper Code: C24SEC329P**
External Marks: 15	**Total Marks: 25**
Internal Marks: 10	**Teacher Name, Mr. Anil Budania**
Month	**Topics**
July 2025	Internship Training
August 2025	Practical problems for plotting of the Bessel's functions of first kind of order 0 to 3 Practical problems to find zeros of Bessel's function of first and second kind.
September 2025	Practical problems to find zeros of first derivative of Bessel function of first kind and Legendre's polynomial. Practical problems for plotting of Legendre polynomial for n=1 to 5 in the interval [0,1] and verifying graphicallythat all roots of Legendre polynomial lies in the interval [0,1].
October 2025	Practical problems related to coefficients of Legendre polynomial. Practical problems based on plotting of Hermite's polynomial.
November 2025	Practical problems related to Laplace Transforms

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-I	**Semester : I**
Subject : Contributions of Indian Mathematicians	**Paper Code: C24VAC114T**
External Marks: 35	**Total Marks: 50**
Internal Marks: 15	**Teacher Name : Mr. Anil Budania**

Month	Topics
July 2025	Unit-I Contribution in Ancient and Medieval Period: Development of Indian mathematics during Vedic and Ancient period.
August 2025	Overview of the Vedic period, Mathematical ideas in the Vedas and manuscripts in Indian mathematics. Life, background, notable works, mathematical contribution of Baudhayana, Pingala, Aryabhata, Brahmagupta, Bhaskaracharya, Mahaviracharya and Lilavati.
September 2025	Kerala School of Mathematics, Madhava of Sangamagrama, Nilakantha Somayaji, Jyesthadeva: Overview of historical backgrounds and their contribution
October 2025	Unit-II Contribution in Modern Period: Srinivasa Ramanujan, Satyendra Nath Bose, Radhanath Sikdar, P.C. Mahalanobis, D.R. Kaprekar: Early life, Education, Challenges, Achievements and their contribution. Introduction to the prestigious Ramanujan Award, Fields Medal, Abel Prize and their significance.
November 2025	Biography and contributions of illustrious mathematicians from India: Subrahmanyan Chandrasekhar, C.R. Rao, S.R. Srinivasa Varadhan, Akshay Venkatesh, Harish Chandra.

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-III/B.Sc-III	**Semester : V**
Subject : Number Theory & Trigonometry	**Paper Code: CML-508(i)**
External Marks: 80	**Total Marks: 100**
Internal Marks: 20	**Teacher Name : Mr. Anil Budania**

Month	Topics
July 2025	Linear Diophantine equation, prime counting function, statement of prime number theorem, Goldbach conjecture, linear congruences
August 2025	Complete set of residues, Chinese remainder theorem, Fermat's little theorem, Wilson's theorem. Section-II Number theoretic functions, sum and number of divisors, totally multiplicative functions, the Möbius inversion formula, the greatest integer function
September 2025	Euler's phi-function, Euler's theorem, reduced set of residues, some properties of Euler's phi-function. Section-III Order of an integer modulo n, primitive roots for primes, composite numbers having primitive roots, Euler's criterion, the Legendre symbol and its properties, quadratic reciprocity, quadratic congruences with composite moduli.
October 2025	Section-IV Exponential, Logarithmic, Circular functions; sin(nx), cos(nx), tan(nx), sinn x , cosn x, tann x, hyperbolic and inverse hyperbolic functions - simple problems. Gregory's series.
November 2025	Summation of Trigonometric series, Trigonometric expansions of sine and cosine as infinite products (without proof).

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-II/B.Sc-II	**Semester : III**
Subject : Mathematical Statistics	**Paper Code: C24MIC315T**
External Marks: 70	**Total Marks: 100**
Internal Marks: 30	**Teacher Name: Dr. Kuldeep Singh**
Month	**Topics**
August 2025	**Introduction to Statistics**: -Definition and Importance, Applications of Statistics in Real Life (e.g., business, health, sports, education). **Types of Data:** Qualitative vs. Quantitative Data, Discrete vs. continuous Data, Primary and Secondary Data, Data Collection and Organization Methods of Data Collection. Surveys, Experiments, and Observations, Sampling Techniques (Random, Stratified, Systematic). **Organizing Data:** Frequency Distribution Tables, Grouped and ungrouped Data, Tally Marks.
September 2025	**Data Representation**:-Graphical Representation of Data: Bar Graphs, Pie Charts. Line Graphs, Histograms and Frequency Polygons. Interpretation of Graphs and Charts.
October 2025	**Measures of Central Tendency**: **Mean** (Arithmetic Average): Calculation for Ungrouped and Grouped Data. **Median:** Finding the Middle Value for Ungrouped and Grouped Data. **Mode**: Identifying the Most Frequent Value.
November 2025	**Measures of Dispersion:- Range**- Definition and its Calculations. Variance and Standard Deviation: Concept and Basic Calculation for Ungrouped Data. **Interquartile Range (IQR)-**Understanding Quartiles and Spread of Data.

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-II/B.Sc-II	**Semester : III**
Subject : Differential Equations Lab	**Paper Code: C24MAT301P**
External Marks: 20	**Total Marks: 30**
Internal Marks: 10	**Teacher Name: Dr. Kuldeep Singh**
Month	**Topics**
August 2025	Basic Commands and symbols to write differential equations Commands used to find the derivative and integration of a function To find the Difference among general solution, singular solution and particular solution.
September 2025	To find the solutions of first and second order differential equations. The plotting of family solutions of differential equations of first, second ar third order.
October 2025	To find the solution of differential equations using method of variation of parameters. To find the solutions of linear differential equations of second order usir built in functions of Python software.
November 2025	To find numerical solutions of a first order ODE using built in functions of Python. To find numerical solutions of a first order PDE using built in functions Python.

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-III/B.Sc-III	**Semester : V**
Subject : Groups and Rings	**Paper Code: CML-506(i) and BAMH-301(i)**
External Marks: 70	**Total Marks: 100**
Internal Marks: 30	**Teacher Name: Dr. Kuldeep Singh**
Month	**Topics**
August 2025	Definition of a group. Example of abelian and nonabelian groups. The group Zn of integers under addition modulo n and the group of U(n) of units under multiplication modulo n, Generator of a group. Cyclic groups, Permutations groups, Alternating groups, Cayley's theorem. Subgroups and Subgroup criteria, Cosets, Left and right cosets, properties of cosets.
September 2025	Index of a sub-group. Coset decomposition, Lagrange's theorem on groups and its consequences, Normal subgroups, Quotient groups, Homomorphisms, isomorphisms, automorphisms on group, Center of a group and class equation of a group and derived group of a group.
October 2025	Introduction to Rings, Subrings, Integral domains and Fields, Characteristics of a ring. Ring homomorphisms, Theorems on Ring homomorphisms, Ideals (Principle, Prime and Maximal) and Quotient rings, Field of quotients of an integral domain.
November 2025	Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion of irreducibility of polynomials over the field of rational numbers, Polynomial rings over commutative rings. Principal ideal domain,Unique factorization domain.

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Lesson Plan

Session 2025-26 (Odd Semester)

Class : BA-III/B.Sc-III	**Semester : V**
Subject : Sequence and Series	**Paper Code: CML-507(i) and BAMH-302(i)**
External Marks: 80	**Total Marks: 100**
Internal Marks: 20	**Teacher Name: Dr. Kuldeep Singh**
Month	**Topics**
August 2025	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points, limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties. Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences , Cauchy's sequence, Cauchy general principle of convergence, sub sequence, subsequential limits.
September 2025	Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series, Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or p-series.Infinite series: DAlembert's ratio test, Raabe's test, Logarithmic test, Cauchy's Nth root test, Gauss Test, Cauchy's Integral test, Cauchy's condensation test. Alternating series: Leibnitz's test, absolute and conditional convergence. Arbitrary series: Abel's lemma, Abel's test, Dirichlet's test.
October 2025	Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Co-efficients, Dirichlet's conditions, Parseval's identity for Fourier series, Fourier series for even and odd functions, Half range series, Change of Intervals
November 2025	Riemann integral: Definition and examples. Darboux's Theorem and condition of existence of Riemann's integral, Integrabililty of continuous, monotonic functions and discontinuous functions. Properties of integrable functions, Continuity and differentiability of integrable functions. Primitive, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus.

Signature

CLASS:B.Sc./B.A.-I Year 1st Sem
NAME OF PAPER – Basic Algebra and Number Theory
PAPER CODE - C24MAT101T
COURSE TYPE- DSC (Scheme –A)
Name of the Teacher:- Dr Harsha

SR. NO.	MONTHS	TOPICS
1.	**July –August 2025**	Symmetric, Skew-symmetric. Hermitian and Skew-Hermitian, Rank of a matrix, Inverse of a matrix. Row rank and column rank of a matrix and Eigen values, eigenvectors and the characteristic equation of a matrix, Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix. Application of matrices to a system of linear (both homogenous and non-homogenous) equations.
2.	September 2025	Theorems on consistency of a system of linear equations, Unitary and Orthogonal Matrices Bilinear and Quadratic forms. Canonical form of a Bilinear form, Matrix notation of bilinear and Quadratic Form Relations between the roots and coefficients of general polynomial equation in one variable. Solution of polynomial equations having conditions on roots and Common roots and multiple roots.
3.	October 2025	Nature of the roots of an equation. Solution of cubic equations (Cardan's method).Biquadratic equations and their solutions, Ferrari's Method.
4.	November 2025	Divisibility, G.C.D. (greatest common divisors), L.C.M. (least common multiple), Problems based on prime numbers, Fundamental Theorem of Arithmetic. Linear Congruence, Euler's Theorem, Fermat's theorem. Wilson's theorem and its converse. Chinese Remainder Theorem

CLASS:B.Sc./B.A.-I Year 1st Sem
NAME OF PAPER -Basic Algebra and Number Theory Lab
PAPER CODE - C24MAT101P
COURSE TYPE – DSC (Scheme –A)
Name of the Teacher:- Dr Harsha

SR. NO.	MONTHS	TOPICS
1.	**July –August 2025**	Introduction to PYTHON Language, The history of PYTHON Language,Learn basic commands and applications, use basic operators and function and explore the different menus in PYTHON Language. Learn Keywords/Reserved words and the use of predefined functions in PYTHON Language. To learn basic operations on matrices.
2.	September 2025	**1.** To find the value of a determinant of matrix of order up to four. **2.** To compute inverse of square matrix of order up to four.**3.** To find Eigen values and Eigen vectors of square matrix of order up to four. **4.** To solve system of linear equations.
3.	October 2025	**1.** To find roots of quadratic, cubic and biquadratic equations.**2.** To find multiple roots of algebraic equations.**3.** To discuss nature of roots of an equation and to learn the concept of divisibility in integers. **4.** To find the number of divisors of an integer.
4.	November 2025	**1.** To find GCD and LCM of two integers. **2.** To find the remainder of an integer when divided by the integer.**3.** To find the integers x, y such that d = ax + by where d is the g.c.d. of a and b. **4.** To solve problem based on the concept of primes and to solve problems based of the concept of linear congruence.

CLASS:B.Sc./B.A.-I Year 1st Sem
NAME OF PAPER - Vector Calculus and Solid Geometry
PAPER CODE - C24SEC129T(i)
COURSE TYPE – SEC (Scheme –A)
Name of the Teacher:- Dr Harsha

SR. NO.	MONTHS	TOPICS
1.	**July –August 2025**	Scalar and vector products of three and four vectors, Reciprocal systems of vectors. Differential operators, Differentiation and partial differentiation of vector functions. Gradient of a scalar point function
2.	September 2025	Geometrical interpretation of gradient, Divergence, Curl of sums and product,Relative identities,**4.** Laplacian operator
3.	October 2025	General equation of sphere, Diametric form of sphere,Center and radius of sphere, Plane section of a sphere
4.	November 2025	Sphere through a given circle,Intersection of two spheres, Radical plane of two spheres,Cylinder, Right circular cylinder, Enveloping cylinder.

CLASS: B.Sc./B.A.-I Year 1st Sem

NAME OF PAPER - Vector Calculus and Solid Geometry Lab

PAPER CODE - C24SEC129P(i)

COURSE TYPE – SEC (Scheme –A)

Name of the Teacher:- Dr Harsha

SR. NO.	MONTHS	TOPICS
1.	**July –August 2025**	1. Basics of PYTHON Language 2. Program to calculate area of Parallelograms using scalar product.3. Program to calculate Work done by a force using scalar product.4. Program To plot 2-D vector field
2.	September 2025	1. Program To plot 3-D vector field.2. Program to find the volume of a parallelepiped using triple product of vectors.3. Program to find the gradient of scalar function and its plotting.
3.	October 2025	**1.** Program to find the divergence of vector function and its plotting.**2.** Program to find the curl of vector function and its plotting.**3.** Program of Tracing of a sphere of given equation.
4.	November 2025	**1.** Program of Tracing of right circular cylinder of given equation.**2.** Program to find the center and radius of sphere.**3.** Program to find the radius of right circular cylinder

CLASS:B.Sc./B.A.-II Year 3rd Sem
NAME OF PAPER –: Differential Equations
PAPER CODE - C24MAT301T
COURSE TYPE- DSC(Scheme –A)
Name of the Teacher:- Dr Harsha

SR. NO.	MONTHS	TOPICS
1.	**July –August 2025**	Geometrical meaning of a differential equation. Exact differential equations, integrating factors.First order higher degree equations solvable for x,y,p Lagrange's equations, Clairaut's equations. Equations reducible to Clairaut's form.Singular solutions. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous.
2.	September 2025	Ordinary simultaneous differential equations. Solution of simultaneous differential equations. Partial differential equations: Formation, order and degree.Linear and Non-Linear Partial differential equations of the first order.Complete solution, singular solution, General solution.
3.	October 2025	Solution of Lagrange's linear equations, Charpit's general method of solution. Linear partial differential equations of second and higher orders, Linear and non-linear homogeneous and non-homogeneous equations with constant coefficients.Partial differential equations with variable coefficients reducible to equations with constant coefficients.Complimentary functions and particular integrals. .
4.	November 2025	Classification of linear partial differential equations of second order, hyperbolic, parabolic and elliptic types.Reduction of second order linear partial differential equations to Canonical (Normal) forms and their solutions. Cauchy's problem for second order partial differential equations.Characteristic equations and characteristic curves of second order partial differential equations.