

## Lesson Plan (2023-24)

### 1St Sem

Name of the Assistant/ Associate Professor: - Dr. Vinod Kumar

Class: B.A/B.Sc 1st

Subject: Mathematics( Algebra)

Week	Topics
Sep 1	Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices
Sep 2	Elementary Operations on matrices. Rank of a matrices. Inverse of a matrix. Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix.
Sep 3	. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix.
Sep 4	Cayley Hamilton theorem and its use in finding the inverse of a matrix.
Oct 1	Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations.
Oct2	Theorems on consistency of a system of linear equations. Unitary and Orthogonal Matrices, Bilinear and Quadratic forms.
Oct 3	Relations between the roots and coefficients of general polynomial equation in one variable.
Oct 4	Solutions of polynomial equations having conditions on roots.
Nov 1	Common roots and multiple roots. Transformation of equations.
Nov 2	Nature of the roots of an equation Descarte's rule of signs.
Nov 3	Solutions of cubic equations (Cardon's method).
Nov 4	Biquadratic equations and their solutions.
Dec 1	Revision

Lesson Plan (2023-24)

Name of Lecturer:-Dr. Vinod kumar

Class and Section :- B.A/B.sc 2<sup>nd</sup>

Semester :- 4th

Subject:- Mathematics (Group and Rings)

Sr. no.	Week/months	Topic / particulars
1	1 <sup>st</sup> / Feb.	Definition of group with example and properties, subgroups and its criteria
2	2 <sup>nd</sup> /Feb.	Generation of group, cyclic group
3	3 <sup>rd</sup> / Feb.	Lagrange theorem and normal subgroups
4	4 <sup>th</sup> / Feb	Quotient group, homomorphism, isomorphism, automorphism
5	1 <sup>st</sup> / March.	Automorphism of cyclic group, Alternating group, Cayley theorem
6	2 <sup>nd</sup> / March	Introduction to ring, subring
7	3 <sup>rd</sup> / march	Fields, Ideal and Quotient rings
8	4 <sup>th</sup> / March	Euclidean rings, polynomial rings
9	1 <sup>st</sup> / April	Polynomial over the rational field
10	2 <sup>nd</sup> / April	The Eisenstein criteria
11	3 <sup>rd</sup> / April	Polynomial rings, Commutative rings
12	4 <sup>th</sup> / April	Unique factorization domain and revision

Signature

## LESSON PLAN OF MATHEMATICS

Name of College:- CH. BANSI LAL GOVT. P.G. COLLEGE LOHARU (BHIWANI)

Academic Session:- 2023-24

Semester:- B.Sc V<sup>th</sup> Sem

Subject:- LINEAR ALGEBRA

Teacher name:- Dr. Vinod kumar

	LESSON PLAN OF LINEAR ALGEBRA
September	
Week 1:	Introduction to Syllabus and Pattern
	Vector space, Subspace
Week 2:	Sum and direct sum of subspaces, Linear span, L.I. and L.D. subsets, finitely generated vector space, finite dimensional vector space.
Week 3:	Basis, Quotient space and its dimension, Homomorphism and isomorphism, Linear transformation and linear form of vector space
october	
Week 1:	Dual space, Bi dual space, annihilator of subspace, Null space, Range space of linear transformation
Week 2:	Rank and Nullity theorem, Algebra of linear transformation, Minimal polynomial of a linear transformation
November	
Week 1:	Singular and non-singular linear transformation, Matrix of linear transformation, change of basis, Eigenvalue and eigen vector
Week 2:	Inner product space, Cauchy- Schwarz inequality, Orthogonal vector, orthogonal sets and basis
Week 3:	Bessel's inequality, Gram-Schmidt orthogonalization process, Adjoint and its properties, Unitary linear transformation
December	Revision



## Lesson Plan (2023-24)

### 3rd Sem

Name of the Assistant/ Associate Professor: - Dr. Vinod kumar

Class: B.A 2nd

Subject: Numerical methods with Programming in C(Math)

Week	Topics
Sep 1	Programmer model of a computer, algorithms, flow chart
Sep 2	Data type, operators and expressions, input/output functions
Sep 3	Decision control structures, logical and conditional statements, Loops, Switch and Case control structure
Sep 4	Strings, character data types, Arithmetic operation on characters
Oct 1	Structure: definition and uses
Oct2	Solution of algebraic and transcendental equations; Bisection method
Oct 3	Regula falsi method, secant method
Oct 4	Fixed point iterative method, Newton Raphson's method
Nov 1	Newton iterative formulae for nth root of a number and order of convergence
Nov 2	Gauss elimination method, Gauss Jordan method
Nov 3	Iterative method and Jacobi method
Nov 4	Gauss seidal method and Relaxation method
Dec 1	Order of convergence and revision

## Lesson Plan (2023-24)

### 6th Sem

Name of the Assistant/ Associate Professor: - Dr. Vinod Kumar

Class: B.A/B.Sc 3rd

Subject: Mathematics( Special function and integral transform)

Week	Topics
Feb 1	<i>Section – I</i> Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions
Feb 2	. Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions
Feb 3	Legendre and Hermite differentials equations and their solutions: Legendre and Hermite functions and their properties-Recurrence Relations
Feb 4	and generating functions. Orthogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials
March 1	Laplace Integral Representation of Legendre polynomial.
March 2	Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems
March 3	Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms
March 4	Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations using Laplace transform.
April 1	Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem
April 2	Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform
April 3	Parseval's identity for Fourier transforms
April 4	solution of differential Equations using Fourier Transforms. And revision

Lesson Plan (2023-24)

Name of Lecturer:-Dr. Vinod kumar

Class and Section :- B.A/B.sc 1<sup>st</sup>

Semester :- 2nd

Subject:- Mathematics (vector calculus)

Sr. no.	Week/months	Topic / particulars
1	1 <sup>st</sup> /Feb.	Scalar and vector product of three vectors, product of four vectors. Reciprocal vectors.
2	2 <sup>nd</sup> /Feb.	Vector differentiation. Scalar Valued point functions, vector valued point functions, derivative along a curve.
3	3 <sup>rd</sup> /Feb.	Directional derivatives
4	4 <sup>th</sup> /Feb	Gradient of a scalar point function, geometrical interpretation of $\text{grad } \phi$ , character of gradient as a point function.
5	1 <sup>st</sup> / March.	Divergence and curl of vector point function, characters of $\text{Div } \vec{f}$ and $\text{Curl } \vec{f}$ as point function, examples.
6	2 <sup>nd</sup> / March	Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator
7	3 <sup>rd</sup> / march	Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors.
8	4 <sup>th</sup> / March	Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates
9	1 <sup>st</sup> / April	Cylindrical co-ordinates and Spherical co-ordinates.
10	2 <sup>nd</sup> / April	Vector integration; Line integral, Surface integral,
11	3 <sup>rd</sup> / April	Volume integral
12	4 <sup>th</sup> / April	Theorems of Gauss, Green & Stokes and problems based on these theorems and revision

Signature