

Lesson Plan (2021-22)

3rd Sem

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

Class: B.A/B.Sc 2nd

Subject: Mathematics(Advance calculus)

Week	Topics
Sep 1	Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability
Sep 2	. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations.
Sep 3	Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms.
Sep 4	Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions.
Oct 1	Change of variables. Homogenous functions & Euler's theorem on homogeneous functions.
Oct2	Taylor's theorem for functions of two variables.
Oct 3	Differentiability of real valued functions of two variables.
Oct 4	Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables.
Nov 1	Lagrange's method of multipliers.
Nov 2	Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature,
Nov 3	Locus of centre of Spherical curvature, Involutives, evolutes,
Nov 4	Bertrand Curves. Surfaces: Tangent planes,
Dec 1	one parameter family of surfaces, Envelopes.

Lesson Plan (2021-22)

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 (2021-22)

5th Sem

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

Class: B.Sc 3rd

Subject: Group and Rings (math)

Week	Topics
Sep 1	Definition of group with example and properties, subgroups and its criteria
Sep 2	Generation of group, cyclic group
Sep 3	Lagrange theorem and normal subgroups
Sep 4	Quotient group, homomorphism, isomorphism, automorphism
Oct 1	Automorphism of cyclic group, Alternating group, Cayley theorem
Oct 2	Introduction to ring, subring
Oct 3	Fields, Ideal and Quotient rings
Oct 4	Euclidean rings, polynomial rings
Nov 1	Polynomial over the rational field
Nov 2	The Eisenstein criteria
Nov 3	Polynomial rings
Nov 4	Commutative rings
Dec 1	Unique factorization domain

LESSON PLAN OF MATHEMATICS

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

Academic Session:- 2022-23

Semester:- B.Sc VIth Sem

Subject:- LINEAR ALGEBRA

Teacher name:- Dr. Vinod kumar

	LESSON PLAN OF LINEAR ALGEBRA
APRIL	
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
May	
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
Week 3:	Singular and non-singular linear transformation, Matrix of linear transformation, change of basis, Eigenvalue and eigen vector
june	
Week 1	Inner product space
Week 2:	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

Lesson Plan (2021-22)

Name of Lecturer:-Dr. Vinod kumar

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

Semester :- 4th

Subject:- Mathematics (Sequence and Series)

Sr. no.	Week/months	Topic / particulars
1	1 st / Feb.	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points,
2	2 nd /Feb.	limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties.
3	3 rd / Feb.	Bolzano-Weierstrass theorem, Open covers, Compact sets and Heine-Borel Theorem.
4	4 th / Feb	Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence,
5	1 st / March.	Cauchy general principle of convergence, Subsequences, Subsequential limits.
6	2 nd / March	Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series,
7	3 rd / march	Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or p-series.
8	4 th / March	Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy's Nth root test
9	1 st / April	Gauss Test, Cauchy's integral test, Cauchy's condensation test. Alternating series, Leibnitz's test, absolute and conditional convergence
10	2 nd / April	, Arbitrary series: Abel's lemma, Abel's test, Dirichlet's test, Insertion and removal of parenthesis, re-arrangement of terms in a series, Dirichlet's theorem
11	3 rd / April	Riemann's Re-arrangement theorem, Pringsheim's theorem (statement only), Multiplication of series,
12	4 th / April	Cauchy product of series, (definitions and examples only) Convergence and absolute convergence of infinite products and revision

Signature

Lesson Plan (2021-22)

Name of Lecturer:-Dr. Vinod kumar

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

Semester :- 2nd

Subject:- Mathematics (vector calculus)

Sr. no.	Week/months	Topic / particulars
1	1 st / Feb.	General equation of second degree. Tracing of conics. Tangent at any point to the conic, chord of contact,
2	2 nd /Feb.	pole of line to the conic, director circle of conic. System of conics.
3	3 rd / Feb.	Confocal conics. Polar equation of a conic, tangent and normal to the conic.
4	4 th / Feb	Gradient of a scalar point function, geometrical interpretation of $\text{grad } \phi$, character of gradient as a point function.
5	1 st / 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 nd / March	Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator
7	3 rd / march	Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors.
8	4 th / March	Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates
9	1 st / April	Cylindrical co-ordinates and Spherical co-ordinates.
10	2 nd / April	Vector integration; Line integral, Surface integral,
11	3 rd / April	Volume integral
12	4 th / April	Theorems of Gauss, Green & Stokes and problems based on these theorems and revision

Signature