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Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Mr. Deepak

Subject- Mathematics

Paper Name – Sequence & Series

Class – B.A./B.Sc. 4th Sem

January, 2024

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. Bolzano-Weierstrass theorem, Open covers, Compact sets and Heine-Borel Theorem.

February, 2024

Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Subsequential limits.
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.

Unit Test.

March, 2024

Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy's nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.

April, 2024

Alternating series, Leibnitz's test, absolute and conditional convergence, 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, Riemann's Re-arrangement theorem, Pringsheim's theorem (statement only), Multiplication of series, Cauchy product of series, (definitions and examples only) Convergence and absolute convergence of infinite products.

Unit Test.

Unit wise Revision.

Deepak

Govt. College Ateli, Mahendergarh

Lesson Plan (Session 2023-24)

Name – Mr. Deepak

Subject- Mathematics

Paper Name – Number Theory & Trigonometry

Class – B.Sc. 2nd Sem

January, 2024

Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple) Primes, Fundamental Theorem of Arithmetic. Linear Congruences, Fermat's theorem. Wilson's theorem and its converse. Linear Diophantine equations in two variables.

February, 2024

Complete residue system and reduced residue system modulo m . Euler's ϕ function Euler's generalization of Fermat's theorem. Chinese Remainder Theorem. Quadratic residues. Legendre symbols. Lemma of Gauss; Gauss reciprocity law. Greatest integer function $[x]$. The number of divisors and the sum of divisors of a natural number n (The functions $d(n)$ and $\sigma(n)$). Moebius function and Moebius inversion formula.

Unit Test.

March, 2024

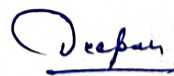
De Moivre's Theorem and its Applications. Expansion of trigonometrical functions. Direct circular and hyperbolic functions and their properties.

April, 2024

Inverse circular and hyperbolic functions and their properties. Logarithm of a complex quantity. Gregory's series. Summation of Trigonometry series.

Unit Test.

Unit wise Revision.



Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Mr. Deepak

Subject- Mathematics

Paper Name – Linear Algebra

Class – B. A. /B.Sc. 6th Sem

January, 2024

Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces, Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension.

February, 2024

Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces, Vector space of all the linear transformations Dual Spaces, Bidual spaces, annihilator of subspaces of finite dimensional vector spaces, Null Space, Range space of a linear transformation, Rank and Nullity Theorem.

Unit Test.

March, 2024

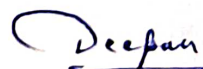
Algebra of Linear Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations, Matrix of a linear Transformation, Change of basis, Eigen values and Eigen vectors of linear transformations.

April, 2024

Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors, Orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces, Gram-Schmidt, Orthogonalization process, Adjoint of a linear transformation and its properties, Unitary linear transformations.

Unit Test.

Unit wise Revision.



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Govt. CollegeAteli.....

Lesson Plan (Session..2023-24.....)

Name - Deepak.....

Subject- Mathematics

Paper Name – Numerical Analysis

Class -B.Sc.: 5th. Sem.....

July. August - 2023

Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae. Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae, Hermite Formula.

September - 2023

Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula. Probability distribution of random variables, Binomial distribution, Poisson's distribution, Normal distribution: Mean, Variance and Fitting.

October - 2023

Numerical Differentiation: Derivative of a function using interpolation formulae. Eigen Value Problems: Power method, Jacobi's method, Given's method, House-Holder's method, QR method, Lanczos method.

November - 2023

Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's onethird and three-eighth rule, Chebychev formula, Gauss Quadrature formula. Numerical solution of ordinary differential equations: Single step methods-Picard's method. Taylor's series method, Euler's method, Runge-Kutta Methods. Multiple step methods; Predictor-corrector method, Modified Euler's method, Milne-Simpson's method.

Deepak

Govt. CollegeA. T. S......

Lesson Plan (Session...2023-24..)

Name -Deepan.....

Subject- Mathematics

Paper Name – Groups and Rings

Class -B.A. H. Sem. (1-3).....

July – August 2023

Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups, Cosets, Left and right cosets, Index of a sub-group Coset decomposition, Lagrange's theorem and its consequences, Normal subgroups, Quotient groups,

September - 2023

Homomorphisms, isomorphisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups, Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem, Center of a group and derived group of a group.

October - 2023

Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphisms, ideals (principal, prime and Maximal) and Quotient rings, Field of quotients of an integral domain.

November - 2023

Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion, Polynomial rings over commutative rings, Unique factorization domain, R unique factorization domain implies so is $R[X_1, X_2, \dots, X_n]$.

Deepan

Govt. CollegeAteli.....

Lesson Plan (Session.2023-24...)

Name -Deepak.....

Subject- Mathematics

Paper Name – Groups and Rings

Class - ..BSc..5th.Sem.....

July- August - 2023

Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups, Cosets, Left and right cosets, Index of a sub-group Coset decomposition, Lagrange's theorem and its consequences, Normal subgroups, Quotient groups,

September - 2023

Homomorphisms, isomorphisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups, Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem, Center of a group and derived group of a group.

October - 2023

Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphisms, ideals (prime, maximal and Quotient rings, Field of quotients of an integral domain.

Nov - 2023

Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion, Polynomial rings over commutative rings, Unique factorization domain, R unique factorization domain implies so is $R[X_1, X_2, \dots, X_n]$.

Deepak

Govt. CollegeAteli.....

Lesson Plan (Session...2023-24....)

Name - ...Deepak.....

Subject- Mathematics

Paper Name – Calculus

Class - ...B.A. I. St. Sem.....

July - August - 2023

Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

September - 2023

Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature, evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.

October - 2023

Tracing of curves in Cartesian, parametric and polar co-ordinates. Reduction formulae. Rectification, intrinsic equations of curve.

November - 2023

Quadrature (area) Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution. Theorems of Pappu's and Guilden.

Deepak

Govt. College ...Heli.....

Lesson Plan (Session...2023-24..)

Name - ..Dr...MONIKA...YADAV..!

Subject- Mathematics

Paper Name – Groups and Rings

Class - ..B.Sc....5th Sem.....

July & Aug. 2023.

Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups, Cosets, Left and right cosets, Index of a sub-group Coset decomposition, Lagrange's theorem and its consequences, Normal subgroups, Quotient groups,

Sept. 2023

Homomorphisms, isomorphisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups, Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem, Center of a group and derived group of a group.

Oct. 2023

Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphisms, ideals (principal, prime and Maximal) and Quotient rings, Field of quotients of an integral domain.

Nov. & Dec. 2023.

Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion, Polynomial rings over commutative rings, Unique factorization domain, R unique factorization domain implies so is $R[X_1, X_2, \dots, X_n]$.



Govt. College ..Ateli:.....

Lesson Plan (Session...2023-24..)

Name - ..Dr...MONIKA.....YADAV

Subject- Mathematics

Paper Name – Algebra

Class - ..B.A...1st Yr:.....

July & Aug. 2023

Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices.
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. Eigenvalues, eigenvectors and the
characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley
Hamilton theorem and its use in finding the inverse of a matrix.

Sep. 2023

Applications of matrices to a system of linear (both homogeneous and non-
homogeneous) equations. Theorems on consistency of a system of linear
equations. Unitary and Orthogonal Matrices, Bilinear and Quadratic forms.

Oct. 2023

Relations between the roots and coefficients of general polynomial equation in
one variable. Solutions of polynomial equations having conditions on roots.
Common roots and multiple roots. Transformation of equations.

Nov. & Dec.

Nature of the roots of an equation Descarte's rule of signs. Solutions of cubic
equations (Cardon's method). Biquadratic equations and their solutions.



Govt. CollegeAteli'.....

Lesson Plan (Session...2023-24...)

Name - ...Dr.:...M.ONIKA...YADAV.. Subject- Mathematics

Paper Name – Partial Differential Equations

Class - ...BA/B.Sc...3rd...sem.....

July, Aug- 2023

Partial differential equations: Formation, order and degree, Linear and Non-Linear Partial differential equations of the first order: Complete solution, singular solution, General solution, Solution of Lagrange's linear equations, Charpit's general method of solution. Compatible systems of first order equations, Jacobi's method.

Sept. 2023

Linear partial differential equations of second and higher orders, Linear and non-linear homogenous and non-homogenous equations with constant co-efficients, Partial differential equation with variable co-efficients reducible to equations with constant coefficients, their complimentary functions and particular Integrals, Equations reducible to linear equations with constant co-efficients.

Oct. 2023

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, Solution of linear hyperbolic equations, Monge's method for partial differential equations of second order.

Nov. 2023

Cauchy's problem for second order partial differential equations, Characteristic equations and characteristic curves of second order partial differential equation, Method of separation of variables: Solution of Laplace's equation, Wave equation (one and two dimensions), Diffusion (Heat) equation (one and two dimension) in Cartesian Co-ordinate system.



Govt. College Ateli, Mahendergarh

Lesson Plan (Session 2023-24)

Name – Dr. Monika Yadav

Subject- Mathematics

Paper Name – Ordinary Differential Equations

Class – B.A./ B.Sc. 2nd Sem

January, 2024

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. Equation reducible to Clairaut's form. Singular solutions.

February, 2024

Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self orthogonal family of curves.. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.

Unit Test.

March, 2024


Linear differential equations of second order: Reduction to normal form. Transformation of the equation by changing the dependent variable/ the independent variable. Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation. Method of variations of parameters. Method of undetermined coefficients.

April, 2024

Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operators $x (d/dx)$ or $t (d/dt)$ etc. Simultaneous equation of the form $dx/P = dy/Q = dz/R$. Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exact. General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant. Method of auxiliary equations.

Unit Test.

Unit wise Revision.


Dr. MONIKA YADAV
Depart. of Mathematics.

Govt. College Ateli, Mahendergarh

Lesson Plan (Session 2023-24)

Name – Dr. Monika Yadav

Subject- Mathematics

Paper Name – Real and Complex Analysis

Class – B.Sc. 6th Sem

January, 2024

Jacobians, Beta and Gamma functions, Double and Triple integrals, Dirichlet's integrals, change of order of integration in double integrals.

February, 2024

Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Coefficients, Dirichlet's conditions, Parseval's identity for Fourier series, Fourier series for even and odd functions, Half range series, Change of Intervals.

Unit Test.

March, 2024

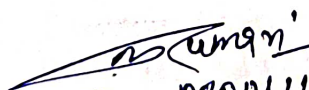
Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex functions, Analytic functions, Cauchy-Riemann equations. Harmonic functions.

April, 2024

Mappings by elementary functions: Translation, rotation, Magnification and Inversion. Conformal Mappings, Mobius transformations. Fixed points, Cross ratio, Inverse Points and critical mappings.

Unit Test.

Unit wise Revision.


Dr. MONIKA YADAV
Deptt. of Mathematics

Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Dr. Monika Yadav

Subject- Mathematics

Paper Name – Special Functions and Integral Transforms

Class – B.A/B.Sc. 4th Sem

January, 2024

Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.

February, 2024

Legendre and Hermite differentials equations and their solutions: Legendre and Hermite functions and their properties-Recurrence Relations and generating functions. Orthogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials, Laplace Integral Representation of Legendre polynomial.

Unit Test.

March, 2024


Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms, Convolution theorem, Inverse Laplace transforms, Convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations using Laplace transform.

April, 2024

Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, solution of differential Equations using Fourier Transforms.

Unit Test.

Unit wise Revision.


Dr. MONIKA YADAV
Department of Mathematics

Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Mr. Naresh

Subject- Mathematics

Paper Name – Number Theory & Trigonometry

Class – B.A./B.Sc. 2nd Sem

January, 2024

Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple) Primes, Fundamental Theorem of Arithmetic. Linear Congruences, Fermat's theorem. Wilson's theorem and its converse. Linear Diophantine equations in two variables.

February, 2024

Complete residue system and reduced residue system modulo m . Euler's ϕ function Euler's generalization of Fermat's theorem. Chinese Remainder Theorem. Quadratic residues. Legendre symbols. Lemma of Gauss; Gauss reciprocity law. Greatest integer function $[x]$. The number of divisors and the sum of divisors of a natural number n (The functions $d(n)$ and $\sigma(n)$). Moebius function and Moebius inversion formula.

Unit Test.

March, 2024

De Moivre's Theorem and its Applications. Expansion of trigonometrical functions. Direct circular and hyperbolic functions and their properties.

April, 2024

Inverse circular and hyperbolic functions and their properties. Logarithm of a complex quantity. Gregory's series. Summation of Trigonometry series.

Unit Test.

Unit wise Revision.



Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Sh. Naresh

Subject- Mathematics

Paper Name – Dynamics

Class – B.Sc. 6th Sem

January, 2024

Velocity and acceleration along radial, transverse, tangential and normal directions. Relative velocity and acceleration. Simple harmonic motion. Elastic strings.

February, 2024

Mass, Momentum and Force. Newton's laws of motion. Work, Power and Energy. Definitions of Conservative forces and Impulsive forces.

Unit Test.

March, 2024

Motion on smooth and rough plane curves. Projectile motion of a particle in a plane. Vector angular velocity.

April, 2024

General motion of a rigid body. Central Orbits, Kepler laws of motion. Motion of a particle in three dimensions. Acceleration in terms of different co-ordinate systems.

Unit Test.

Unit wise Revision.



Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Mr. Naresh

Subject- Mathematics

Paper Name – Programming in C and Numerical Methods

Class – B.Sc. 4th Sem

January, 2024

Programmer's model of a computer, Algorithms, Flow charts, Data types, Operators and expressions, Input / outputs functions.

February, 2024

Decisions control structure: Decision statements, Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures. Functions, Preprocessors and Arrays.

Unit Test.

March, 2024

Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters. Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures. Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions. Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method. Newton's iterative method for finding pth root of a number, Order of convergence of above methods.

April, 2024

Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU decomposition method). Crout's method, Cholesky Decomposition method. Iterative method, Jacobi's method, Gauss-Seidal's method, Relaxation method.

Unit Test.

Unit wise Revision.



Govt. CollegeAteli.....

Lesson Plan (Session...2023-24....)

Name - ..Naresh.....

Subject- Mathematics

Paper Name – Calculus

Class -B.Sc...Ist.Sem.....

July - Aug. , 2023

Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

Sept. 2023

Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes, asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, parametric curves, polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature, evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Type of cusps.

Oct. 2023

Tracing of curves in Cartesian, parametric and polar co-ordinates. Reduction formulae. Rectification, intrinsic equations of curve.

Nov. - Dec. 2023

Quadrature (area) Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution. Theorems of Pappu's and Guilden.



Govt. CollegeAteli.....

Lesson Plan (Session..2023-24.....)

Name - .Naresh.....

Subject- Mathematics

Paper Name – Advanced Calculus

Class - ..B.Sc...3rd.Sem.....

July - August, 2023

Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms.

September, 2023

Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables.

October, 2023

Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers.

November - December, 2023

Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature, Locus of centre of Spherical curvature, Involutives, evolutes, Bertrand Curves. Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.


Naresh

Govt. CollegeAteli.....

Lesson Plan (Session...2023-24.....)

Name - .Narresh..... Subject- Mathematics

Paper Name – Numerical Analysis

Class -B.A..5th..Sem.....

July - August , 2023

Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae. Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae, Hermite Formula.

September , 2023

Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula. Probability distribution of random variables, Binomial distribution, Poisson's distribution, Normal distribution: Mean, Variance and Fitting.

October , 2023

Numerical Differentiation: Derivative of a function using interpolation formulae. Eigen Value Problems: Power method, Jacobi's method, Given's method, House-Holder's method, QR method, Lanczos method.

November - December , 2023

Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's onethird and three-eighth rule, Chebychev formula, Gauss Quadrature formula. Numerical solution of ordinary differential equations: Single step methods-Picard's method. Taylor's series method, Euler's method, Runge-Kutta Methods. Multiple step methods; Predictor-corrector method, Modified Euler's method, Milne-Simpson's method.



Govt. CollegeAteli.....

Lesson Plan (Session..2023-24.....)

Name - ...Naxesh.....

Subject- Mathematics

Paper Name – Advanced Calculus

Class - ...B.A. 3rd Sem.....

July - Aug , 2023

Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem.

Sept. 2023

Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers.

Oct. 2023

Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature, Locus of centre of Spherical curvature, Involutives, evolutes, Bertrand Curves.

Nov. - Dec. 2023

Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.



Govt. CollegeA.T.E.L.I.....

Lesson Plan (Session...2023-24..)

Name - P. RONAN. YADAV.

Subject- Mathematics

Paper Name – Advanced Calculus

Class - B.Sc...3rd Sem. (Ssc-B)

July - August - 2023

Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms.

September - 2023

Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables. Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables.

October - 2023

Differentiability of real valued functions of two variables. Schwarz and Young's theorem. Implicit function theorem. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers.

November 2023

Curves: Tangents, Principal normals, Binormals, Serret-Frenet formulae. Locus of the centre of curvature, Spherical curvature, Locus of centre of Spherical curvature, Involutives, evolutes, Bertrand Curves. Surfaces: Tangent planes, one parameter family of surfaces, Envelopes.

UNIT - WISE TEST

P. Ronan Yadav

Govt. CollegeA.T.E.L.....

Lesson Plan (Session...2023-24....)

Name - ..POONAM..YADAV

Subject- Mathematics

Paper Name - Advanced Calculus

Class - ...BA...3rd Sem.....

July - August 2023

Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity, chain rule of differentiability. Mean value theorems; Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations.

September - 2023

Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms.

October - 2023

Limit and continuity of real valued functions of two variables. Partial differentiation. Total Differentials; Composite functions & implicit functions. Change of variables.

November - 2023

Homogenous functions & Euler's theorem on homogeneous functions. Taylor's theorem for functions of two variables.

UNITWISE REVISION

Poonam Yadav

Govt. CollegeA.T.E.H.I.....

Lesson Plan (Session...2023-2024...) Odd Sem.

Name - ..POONAN..YADAV.....

Subject- Mathematics

Paper Name - Real Analysis

Class - ..BA./B.Sc....5th Sem....(Sec.-A)..

July - August - 2023

Riemann integral, Integrability of continuous and monotonic functions, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus.

September - 2023

Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter. Continuity, Differentiability and integrability of an integral of a function of a parameter.

October - 2023

Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalent metrics, Cauchy sequences, completeness, Cantor's intersection theorem, Baire's category theorem, contraction Principle.

Nov - 2023

Continuous functions, uniform continuity, compactness for metric spaces, sequential compactness, Bolzano-Weierstrass property, total boundedness, finite intersection property, continuity in relation with compactness, connectedness, components, continuity in relation with connectedness.

UNIT WISE TEST

Poonan Yadav

Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Mrs. Poonam Yadav

Subject- Mathematics

Paper Name – Ordinary Differential Equations

Class – B.Sc. 2nd Sem

January, 2024

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. Equation reducible to Clairaut's form. Singular solutions.

February, 2024

Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self orthogonal family of curves.. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.

Unit Test.

March, 2024

Linear differential equations of second order: Reduction to normal form. Transformation of the equation by changing the dependent variable/ the independent variable. Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation. Method of variations of parameters. Method of undetermined coefficients.

April, 2024

Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operators x (d/dx) or t (d/dt) etc. Simultaneous equation of the form $dx/P = dy/Q = dz/R$. Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exact. General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant. Method of auxiliary equations.

Unit Test.

Unit wise Revision.

Poonam yadav

Govt. College Ateli, Mahendergarh

Lesson Plan (Session 2023-24)

Name – Mrs. Poonam Yadav

Subject- Mathematics

Paper Name – Real and Complex Analysis

Class – B.A/B.Sc. 6th Sem

January, 2024

Jacobians, Beta and Gamma functions, Double and Triple integrals, Dirichlet's integrals, change of order of integration in double integrals.

February, 2024

Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Coefficients, Dirichlet's conditions, Parseval's identity for Fourier series, Fourier series for even and odd functions, Half range series, Change of Intervals.

Unit Test.

March, 2024

Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex functions, Analytic functions, Cauchy-Riemann equations. Harmonic functions.

April, 2024

Mappings by elementary functions: Translation, rotation, Magnification and Inversion. Conformal Mappings, Mobius transformations. Fixed points, Cross ratio, Inverse Points and critical mappings.

Unit Test.

Unit wise Revision.

Poonam Yadav

Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Mrs. Poonam Yadav

Subject- Mathematics

Paper Name – Special Functions and Integral Transforms

Class – B.A/B.Sc. 4th Sem

January, 2024

Series solution of differential equations – Power series method, Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties-Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions.

February, 2024

Legendre and Hermite differentials equations and their solutions: Legendre and Hermite functions and their properties-Recurrence Relations and generating functions. Orthogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials, Laplace Integral Representation of Legendre polynomial.

Unit Test.

March, 2024

Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems, Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms, Convolution theorem, Inverse Laplace transforms, Convolution theorem, Inverse Laplace transforms of derivatives and integrals, solution of ordinary differential equations using Laplace transform.

April, 2024

Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem, Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms, solution of differential Equations using Fourier Transforms.

Unit Test.

Unit wise Revision.

Poonam yadav

Govt. College Ateli, Mahendergarh
Lesson Plan (Session 2023-24)

Name – Mrs. Poonam Yadav

Subject- Mathematics

Paper Name – Programming in C and Numerical Methods

Class – B.A./B.Sc. 4th Sem

January, 2024

Programmer's model of a computer, Algorithms, Flow charts.

February, 2024

Data types, Operators and expressions, Input / outputs functions.

Unit Test.

March, 2024

Decisions control structure: Decision statements, Logical and conditional statements.

April, 2024

Implementation of Loops, Switch Statement & Case control structures.
Functions, Preprocessors and Arrays.

Unit Test.

Unit wise Revision.

Poonam Yadav