

Govt. College, Nagina (N.U.H). Sub. - Mathematics
(Session - 2021-22) Name of (Paper)
Class - B.Sc. 1st Sem. Book -
Lesson Plan Month-wise Algebra
(Paper - I)

<u>Month</u>	<u>Topic</u>
Oct, 2021	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.
Nov, 2021	Row Rank and Column rank of a matrix, eigen values, eigen vectors and the characteristic equation of a matrix, Minimal poly of a Matrix, Cayley Hamilton theorem and its use in finding the inverse of a matrix, Related Assignment
Dec, 2021	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, Related Assign
Jan, 2022	Relations b/w the roots and coefficients of general poly eq. in one variable. sol. of poly. equations having conditions on roots. Common roots and multiple roots. Transformation of equations, Related Assign.
Feb, 2022	Nature of the roots of an equation. Descartes's rule of signs. Solutions of Cubic equation (Cardan's method). Binomial

equations and their solutions, Related Assign

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Govt College, Nagina (Nudh)

(Session - 2021-22)

Class - B.Sc 1st Sem.

Lesson Plan Month-wise

Sub - Mathematics

Name of Book -

Calculus

(Paper - II)

Month

Oct, 2021

Topic
def. of the limit of a function, Basic properties of limits, Continuous functions and classification of discontinuities, differentiability.

Nov, 2021

Successive differentiation, Leibnitz theorem, Maclaurin and Taylor series expansions, 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, Related Assignment

Dec, 2021.

Tangential polar equations, Centre of curvature, circle of curvature, Chord of Curvature, evolutes, Tests for concavity and convexity, Related Assignment

Jan, 2022

Points of inflexion, Multiple points, cusps, nodes and conjugate points, Type of cusps, Related Assignment

Feb, 2022

Tracing of curves in Cartesian, parametric and polar coordinates, Reduction formulae, rectification, intrinsic eq. of curve, Related Assignment

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Govt. College, Nagina (N.Y.S.) Sub. - Mathematics
 (Session - 2021-22) Name of Book -
 Class - B.Sc. 1st Sem. Solid Geometry
 Lesson Plan Month-wise (Paper - III)

<u>Month</u>	<u>Topic</u>
Oct, 2021	General eq. of second degree, Tracing of conics, tangent at any point to the conic, chord of contact, pole of line to the conic.
Nov, 2021	director circle of conic, System of conics, Confocal conics, polar equations of a conic, tangent and normal to the conic, Assignment
Dec, 2021.	Sphere: Plane section of a sphere, sphere through a given circle, intersection of two spheres, radical plane of two spheres, coaxial system of spheres, Assignment
Jan, 2022	Cones, Right Circular Cone, enveloping cone and reciprocal cone. Cylinder: Right Circular Cylinder and enveloping cylinder, Assignment
Feb, 2022	Central Conicoids: eq. of tangent plane, director sphere, Normal to the conicoids, polar plane of a point, enveloping cone of a conicoid, enveloping cylinder of a conicoid, Assignment

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Govt. College, Nagina (Muz). Sub - Mathematics
(Session - 2021-22) Name of Book -
Class - B.Sc. IIIrd Sem. Advanced Calculus
Lesson Plan Month-wise (Paper - I)

Month	Topic
Oct, 2021	Continuity, seq. continuity, properties of continuous functions, uniform continuity, chain rule of diff, Mean Value theorems, Rolle's theorem and Lagrange's mean value theorem and their geo. interpretation
Nov, 2021	Taylor's theorem with various forms of remainders, Darboux intermediate value theorem for derivatives, Indeterminate forms, limit and continuity of real valued functions of two variables, partial diff, total differentials, composite functions and implicit function, Assign.
Dec, 2021.	Change of variables, Homogeneous functions and Euler's theorem on homogeneous function, Taylor's theorem for function of two variables, Related Assignment
Jan, 2022	Diff of real valued functions of two variables, Schwarz and Young's theorem, Implicit function theorem, Assignment
Feb. 2022	Maxime, Minim and saddle points of two variables, Lagrange's method of multipliers, curves: tangents, Principal normals, binormals, Serret-Frenet formulae, locus of the centre of curvature, spherical curvature, locus of centre of spherical curvature, involutes, Assignment.

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10/10/21
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UPVU College, Nagpur (M.P.)
(Session - 2021-22)

Class - B.Sc. IIIrd Sem.

Lesson Plan Month-wise

Sub. - Mathematics
Name of Book -
Partial diff equations
(Paper - II)

Month	Topic
Oct, 2021.	Partial diff. equations: formation, order and degree, linear and non-linear partial diff equations of the first order: complete sol., singular sol., General solution.
Nov, 2021	Solution of Lagrange's linear equations, Christoff's general method of solution, compatible systems of first order equations, Jacobi's Method, Assign
Dec, 2021.	Linear partial diff. equations of second and higher order, linear and non-linear homo. and non-homogeneous equations with constant coefficients, partial diff. equations with variable coefficients reducible to equations with constant coefficients, Assignment
Jan, 2022	Complimentary functions and particular integrals, equations reducible to linear eqns with constant coefficients, classification of linear partial diff equations of second order, hyperbolic, parabolic and elliptic types, reduction of second order linear partial diff equations to Canonical (Normal) forms and their solutions, Monge's method for partial diff equations of second order, Assignment

Feb, 2022

Cauchy's problem for second order partial differential equations,
characteristic equations
and char. curves of second order partial differential equations,
Method of separation of variables,
Assignment.

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Govt. College, Nagina (Nth). Sub. - Mathematics
(Session - 2021-22) Name of Book -
Class - B.Sc. IIIrd Sem. Statics
Lesson Plan Month-wise (Paper-III)

Month

Topic

Oct, 2021

Composition and resolution of forces.

Nov, 2021

Parallel forces, Moments and Couples, Assignment

Dec, 2021

Analytical conditions of equilibrium of coplanar forces, friction, Assignment

Jan, 2022

Centre of Gravity, Virtual work. forces in three dimensions, Assign.

Feb, 2022

Poincots central axis, wrenches, Assignment

Sub. Teacher

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Govt. College, Nagina (Nrbh)
(Session-2021-22)
Class - B.Sc. 5th Sem.

Sub. - Mathematics
(Paper)
Name of Book -
Real Analysis
(Paper - I)

Lesson Plan Month-wise

Month

Topic

Oct, 2021

Riemann Integral, Integrability of continuous and monotonic functions, The fundamental theorem of integral calculus.

Nov, 2021

Mean value theorems of integral calculus, Improper Integrals and their convergence, comparison Tests, Abels and Dirichlet's tests, Fubini's integral, Integral as a function of a parameter, Related Assignment.

Dec, 2021

Continuity, Diff. and integr. of an integral of a function of a parameter, def. and ex. of metric spaces, neighbourhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalent metrics, Related Assign.

Jan, 2022 Cauchy sequences, Completeness, Cantor's intersection theorem, Baire's category theorem, contraction principle, Continuous functions, uniform continuity, compactness for metric spaces.

Feb, 2022 sequential compactness, Bolzano-Weierstrass property, total boundedness, finite intersection property, continuity in relation with compactness, connectedness, components, continuity in relation with connectedness, Arzela

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Govt. College, Nagpur (Muh).
(Session - 2021-22)
Class - B.Sc. 5th Sem.
Lesson Plan Month-wise

Sub. - Mathematics
Name of (Paper) Book -
Groups and Rings
(Paper - II)

Month

Topic

- Oct, 2021 Def. of a group with example and simple properties of groups, subgroups and subgroup criteria, Generation of groups, cyclic groups, Cosets.
- Nov, 2021 Left and Right cosets, Index of a subgroup, Coset decomposition, Lagrange's theorem and its consequences, Normal subgroup, Quotient groups, Homomorphisms, isomorphisms, automorphisms and inner automorphisms of a group, Related Assignment
- Dec, 2021 Automorphisms of cyclic groups, Permutation groups, Even and odd permutations, Alternating groups, Cayley's theorem, Center of a group and derived group of a group, Related Assignment
- Jan, 2022 ~~Set~~ Introduction to rings, subrings, integral domains and fields, characteristics of a ring, Ring homomorphisms, ideals, Related Assignment
- Feb, 2022 Ideals (Principle, Prime and Maximal) and Quotient rings, field of quotients of an integral domain, Related Assignment

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Govt. College, Nagina (U.P.) Sub. - Mathematics
 (Session - 2021-22) Name of Paper -
 Class - B.Sc 5th Sem Num. Analysis
 Lesson Plan Month wise (Paper - III)

Month

Topic

Part A (Theory)

- Oct, 2021 finite diff operators and their relations, finding the missing terms and effect of error in a diff. tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae, Related Assignment
- Nov, 2021 Interpolation with unequal intervals: Newton's div. diff, Lagrange's interpolation formulae, Hermite formula, Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling Bessel formulae, Prob. dist. of random variables, Binomial dist, Poisson's dist, Related Assignment
- Dec, 2021 Normal distribution: Mean, Variance and fitting, Num. Differentiation: derivative of a function using interpolation formulae as studied in Acc. - I and II, eigen-value problems: Power Method, Jacob's Method, Givens Method, House - Holder's Method, QR Method, Lanczos
- Jan, 2022 Numerical Integration, Newton - Cotes's quadrature formulae, Trapezoidal rule, Simpson's one third and three - eight rule, Chebyshev formulae, Gauss Quadrature formulae, Related Assign

10/4/22
6/1/2022

TOPIC

Num sol. of ordinary diff 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, Related Assignments

Part-B (Practical)

Implementation of num. methods, studied in the theory paper in C prog. language

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Sub. - B. Math - I
(Session - 2021-22)
Class - B. Com. Ist Sem.

(B. Com. Ist Sem.)

Lesson Plan Month-wise

<u>Month</u>	<u>Topic</u>
Oct, 2021	Indices and Logarithms .
Nov, 2021	Theory of Sets: Meaning, elements, types, presentation and equality of sets, Union, Intersection, Complement and diff. of sets, Venn Diagram, Cartesian product of two sets, Applications of Set Theory, Assignment.
Dec, 2021	Permutations and combinations, Assignment
Jan, 2022	Sequences and series, A.P, G.P, Assignment
Feb, 2022	Data Interpretations Introduction, approaches to data interpretation, tabulation, Bar graphs, Pie Charts, line graphs, Mix graphs, Assignment

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