

Govt. College, Nagina (N.H.),
(Session - 2021-22)
Class - B.S.C. 2nd Sem.

Lesson Plan Month-Wise

Sub. - Mathematics
Name of Paper -
Number Theory and
Trigonometry.
(Paper - I)

<u>Month</u>	<u>Topic</u>
April, 2022	Divisibility, G.C.D., L.C.M., Primes, fundamental theorem of Arithmetic. Linear Congruences, Fermat's theorem. Wilson's theorem and its converse. Linear Diophantine eqns in two variables, complete residue system and reduced residue system modulo m . Euler's ϕ function Euler's generalization of Fermat's theorem. Assignment.
May, 2022	Chinese Remainder theorem, Quadratic residues, Legendre symbols. Lemma of Gauss: Gauss reciprocity law, greatest integer function, the number of divisors and sum of divisors of a natural number n . Möbius function and Möbius inversion formula, de Moivre's theorem and its applications, exp. of trig. functions. Assignment.
June, 2022	Direct circular and hyperbolic functions and their properties, inverse circular and hyperbolic functions and their properties, logarithm of a complex quantity. Gregory's series. Summation of Trigonometry series. Assignment.

Subject Teacher
Marish Ashi
OR Marish Ashi

Govt. College, Nagina (Nrbh).
 (Session - 2021-22)
 Class - B.S.C. 2nd Sem
Lesson Plan Month-wise

Sub. - Mathem
 Name of Paper -
 Ordinary differential
 equations
 (Paper - II)

<u>Month</u>	<u>Topic</u>
April, 2022	Geometrical meaning of a diff. equation, Exact diff. equations, integrating factors, first order higher degree equations solvable for x, y, p Lagrange's equations, Clairaut's equation reducible to Clairaut's form. Singular solutions, orthogonal trajectories: in Cartesian coordinates and polar coordinates, self orthogonal family of curves, Assignment
May, 2022	Linear diff. equations with constant coefficients, Homogeneous linear ordinary diff. equations, equations reducible to homogeneous, linear diff. equations of second order: Reduction to normal form, transformation of the equation by changing the dependent variable. Sol by operators of non homogeneous linear diff. equations. Reduction of order of a diff. equation. Assignment
June, 2022	Method of variations of parameters, Method of undetermined coefficients, ordinary simultaneous diff. equations, sol. of simultaneous diff. equations involving operators $x(d/dx)$ or $t(d/dt)$ etc. Simultaneous equation of the form $dx/p = dy/q = dz/r$. Total diff. 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, Relat.

Sub. Teacher ^{Assigner}
Manish Agli
Dr. Manish Agli

Govt. College, Nagina (Nuh) Sub - Mathematics
(Session - 2021-22) Name of Paper -
Class - B.Sc. 2nd Sem. Vector Calculus
Lesson Plan Month-wise (Paper - III)

<u>Month</u>	<u>Topic</u>
April, 2022	Scalar and Vector Product of three vectors, products of four vectors, reciprocal vectors, vector differentiation, scalar valued point functions, Vector valued point functions, derivative along a curve, directional derivatives, gradient of a scalar point function, geo. interpretation of grad ϕ , character of gradient as a point function, Related Assignment.
May, 2022	Divergence and curl of a vector point function, characters of Div. \vec{f} and Curl \vec{f} as point function, examples, Gradient, divergence and curl of sums and product and their related vector identities, Laplacian operator, orthogonal curvilinear coordinates, conditions for orthogonality, fundamental triad of mutually orthogonal unit vectors, Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates, Related Assignment.

Month
June, 2022

Topic

Cylindrical coordinates and spherical coordinates, vector integration; Line integral, surface integral, volume integral. Theorems of Gauss, Green and Stokes and problems based on these theorems, Related Assignment.

Subject Teacher
Manish Aggarwal
Dr. Manish Aggarwal

Govt. College, Nagina (Math). Sub-Mathematics
(Session - 2021 - 22) Name of Paper -
Class - B.Sc. 4th Sem Sequences and
Lesson Plan Month-wise Series
(Paper - I)

<u>Month</u>	<u>Topic</u>
April, 2022	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighbourhoods, 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, sequences: Real sequence and their convergence, theorems on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Assignment
May, 2022	Cauchy general principle of convergence, subsequences, 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 geometrical series, Hyper Harmonic series or P-series, 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, Assignment
June, 2022	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,
Insertion and Removal of parenthesis, rearrangement
of terms in a series, Dirichlet's theorem, Riemann
Rearrangement theorem, Pringsheim's theorem,
Multiplication of series, Cauchy product of
series, convergence and absolute convergence
of infinite products, Assignment

Sub.
~~Teacher~~
Manish Agli
Dr. Manish Agli

Govt. College, Nagina (U.P.)
(Session - 2021-22)
Class - B.Sc 4th Sem.
Lesson Plan Month-wise

Sub - Mathematics
Name of Paper -
Special functions and
Integral Transforms
(Paper - II)

<u>Month</u>	<u>Topic</u>
April, 2022	Series Solution of diff. equation - power series method, def'n 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, Legendre and Hermite differential equations and their solutions: Legendre and Hermite functions and their properties - Recurrence relations and generating function, Assignment
May, 2022	Orthogonality of Legendre and Hermite polynomials, Rodrigue's formula for Legendre and Hermite polynomials, Laplace integral representation of Legendre Poly, Laplace Transform - Existence theorem for Laplace transforms, Linearity of the Laplace transforms, shifting theorems, Laplace transform of derivatives and integrals, diff and intg. of Laplace transforms, convolution theorem, inverse Laplace Transforms, convolution theorem, inverse Laplace Transforms of derivatives and integrals, Assignment
June, 2022	Solution of ordinary diff. equations using Laplace Transform, Fourier Transforms: Linearity property, shifting Modulation, convolution theorem,

fourier transform of derivative, Relations between
fourier transform and Laplace Transform, Parseval's
identity for fourier transforms, sol. of diff
equations using fourier transforms, Assignments

Subject Teacher
Marish Agbi
Dr. Marish Agbi

Govt. College, Nagina (Nrbh).

(Session - 2021-22)

Class - B.Sc. 4th Sem.

Lesson Plan Month-wise

Sub. - Mathem
Name of Paper -
Prog-in C and
Numerical Methods
(Paper - III)
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Month

Topic

April, 2022

Programmer's model of a computer, Algorithms,
Flow Charts, Data Types, operators and
expressions, Input/Output functions, decisions,
control structure: decision statements,
logical and conditional statements,
impl. of loops, Assignment

May, 2022

Switch statement and case control
structures, functions, preprocessors and Arrays,
Strings: character Data Type, standard
string handling functions, Arithmetic
operations on characters, structures: def;
using structures, use of structures in
Arrays and Arrays in structures, pointers
pointers data type, pointers and Arrays,
pointers and functions, sol. of algebraic
and Transcendental equations: bisection
method, regula falsi method, secant
method, Newton-Raphson's method, Assignment.

Month	Topic
June, 2022	Newton's iterative method for finding n th root of a number, Order of convergence of above methods, Simultaneous linear algebr. equations Gauss-elimination method, Gauss-Jordan Method, Triangularisation method, Crout's method, Cholesky decomposition method, Iterative Method, Jacobi's Method, Gauss-Seidel's Method, Relaxation Method, Assignment

Part - B (Practical)

There will be a separate practical paper which consist simple programs in C and the implementation of Newn Method studied in theory paper.

Subject Teacher
Manish Agha
Dr. Manish Agha

Govt. College, Nagpur (Mh). Sub - Math
(Session - 2021-22) Name of Paper -
Class - B.Sc. 6th sem Real and
Complex Analysis
Lesson Plan Month-wise (Paper - I)

Month

Topic

April, 2022

Jacobians, Beta and Gamma functions, Double
and Triple integrals, Dirichlet's integral,
Change of order of integration in
double integrals, Fourier's series = Fourier
expansion of piecewise monotonic functions,
Properties of Fourier coefficients, Assignment

May, 2022

Dirichlet's conditions, Parseval's identity
for Fourier Series, Fourier series for
even and odd functions, Half range
series, Change of Intervals, Extended
Complex Plane, Stereographic projection
of complex numbers, continuity and
differentiability of complex functions,
Analytic functions, Assignment

June, 2022

Cauchy-Riemann equations, Harmonic
functions, Mapping by elementary
functions: Translation, rotation, magnification

and inversion, conformal mappings, Mobius transformations, fixed points, Cross ratio, Inverse points and critical mappings

Assignment

Subject Teacher
Manish Agri
Dr. Manish Agri

Govt. College, Nagina (Nuh). Sub.- Mathematics
(Session - 2021-22) Name of Paper -
Class - B.Sc. 6th Sem Linear Algebra
Lesson Plan Month-wise (Paper - II)

Month	Topic
April, 2022	Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span and 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, Homomorphism and isomorphism of vector spaces, linear transformations and linear forms on vector spaces, Vector space of all the linear transformations, Assignment

May, 2022	Dual spaces, Bidual spaces, annihilator of subspaces subspaces of finite dimensional vector spaces, Null space, Range space of a linear transformation, Rank and Nullity theorem, Algebra of linear transformations
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Month

Topic

Minimal poly. of a linear transformation,
Change of basis, eigen values and
eigen vectors of linear transformation,
Assignment.

June, 2022

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, Assignment

Subject Teacher

Manik Ashu

Dr. Manik Ashu

Govt. College, Nagina (Nrbh). Sub-- Mathematics
(Session - 2021-22) Name of Paper

class - B.Sc. 6th sem Dynamics
(Paper - III)

Lesson Plan Month-wise

Month

Topic

April, 2022

Velocity and acceleration along radial, transverse, tangential and normal directions, relative vel and acc, S.H.M; elastic strings, Mass, Momentum and force, Newton's law of motion, Related Assignment

May, 2022

Work, Power and energy, definitions of conservative forces and impulsive forces, Motion on smooth and rough plane curves, projectile motion of a particle in a plane, Related Assignment

June, 2022

Vector angular velocity, General motion of a rigid body, Central orbits, Kepler laws of motion, Motion of a particle in three dimensions, Acceleration in terms of diff coordinate systems, Assignment, Related Assignment.

Subject - Teacher

Manish Agli

Dr. Manish Agli

Govt. College, Nagina (N.Y.).
(Session - 2021-22) Sub. - B. Math - II
Class - B.COM. IIIrd Sem.
Lesson Plan Month-wise

<u>Month</u>	<u>Topic</u>
Oct, 2021	Matrices and Determinants = Def. of a Matrix, Types of Matrices, Algebra of Matrices, Calculation of values of determinants upto third order.
Nov, 2021	Adjoint of a Matrix, elementary row and column operations; finding inverse matrix through adjoint and elementary row or column operations; sol. of a system of linear equations having unique solution and involving not more than three variables; Assignment
Dec, 2021	Differentiation = (Only algebraic problem); App. of differentiation; Assignment
Jan, 2022	Compound Interest and Annuities = Certain different types of interest rate, Concept of present value and amount of a sum; Types of annuities; Present value and amount of an annuity, including the case of continuous compounding.

Month

Topic

Jan, 2022

Assignment.

Feb, 2022

Ratio, Proportion and Percentage; Profit and Loss, Assignment

Sub. Teacher
Marish Aglu

Dr. Marish Aglu