Teaching plan Session (2022-23)

Class :- B.sc/ B.A sem I. **Name of Teacher:- Hemant Kumari**

Subject :- Mathematics. **Name of Paper :- Calculus I and Linear Algebra**

Sr. No.	**Date(Weekly)**	**Subject related syllabus**
1	**1-5 Sep.**	Differential Calculus: € -Gdefinition of the limit of a function. Basic properties of limit``
2	**7-12 Sep.**	Continuou`` functions and classification of discontinuities. Differentiability, Derivative of nth order
3	**14-19 Sep**	Leibnitz theorem, Asymptotes. Test for concavity and c`onvexl{y
4	**21-26 Sep**	Poims of ln flexion, Tracing of Cui.Yes with y'and y"(Standard curves in Cartesian form without use of Grapher).
5	**28 Sep to 3 Oct.**	Functions of several variables: Limits, continuity and differentjability of two varl'ables.
6	**5-10 Oct**	Partial derivatives and its Linearization, Chain rule, Partial deriva[ive with c()n``trtiilied variable`
7	**12-17 Oct.**	`. Homogeneous func[Ions, Euler theorem and its applications, Extreiiie v£`lue` and ``addle point``, Lagrange multiplier`,
8	**26-31 Oct.**	Taylor's theorem and lt`` linear ;ind quadratic approxuTta[ion.
9	**2-7 Nov.**	I:li.meiitary operation on matrices, Inverse of a matrix using Gauss Jordan Method. Linear independence of row and column vectors,
10	**8-14 Nov.**	Row rank, Column rank and their cquivaleiice Eigen values. Eigen vectors and the characteristic equation of a matrix, Diagonalization`
11	**16-21 Nov.**	Cayley-Hamilton theorem and its use in finding inverse of a matrix, Consistency of a system of. linear equations.
12	**23 Nov. to 3 Dec.**	**Revision & M.S.T.**

Teaching plan Session (2022-23)

Class :- B.sc/B.A sem II. **Name of Teacher :- Hemant Kumari**

Subject :- Mathematics. **Name of Paper :- Calculus II and Analytic Geometry**

Sr.No.	Date(Weekly)	Subject related syllabus
1	1-6 Feb.	Double integrals, Double integrals in Polar Form, Change of order and change of variable in double integral.
2	8-13 Feb.	Triple integrals in Rectangular co-ordinates. Triple integrals in Cylindrical and Spherical co-ordinates.
3	15-20Feb.	Applications to evaluation of Areas, Volume, Centre of Gravity and Moments of Inertia.
4	22-27 Feb.	Vectors in the plane , Cartesian Co-ordinates and vectors in spaces, Dot and cross products. Lines and planes in space.
5	1-6 March	Line integrals, vector fields , work circulations and flux, Path independence, Potential Functions and Conservative Fields.
6	8-13 March	Green theorem in Plane, surface area and surface integrals, Stokes Theorem and the divergence theorem.
7	15-20 March	**Sphere:** Section of a sphere by a plane. sphere through a given circle.
8	22 Mar to3 Apr.	Intersection of a line and sphere, tangent line, tangent plane, angle of intersection of two spheres and condition of orthogonality.
9	5-17 April.	**Cone:** general second degree equation of a cone, its intersection with a plane and with a line, enveloping cone, right circular cone, the cone
10	19-24 April	**Cylinder:** enveloping cylinder, right circular cylinder.
11	26 April to 4May	**Revision**
12	1-6 Feb.	**M.S.T.**

GOVT. SHIVALIK COLLEGE NAYA NANGAL

TEACHING PLAN (SESSION 2022-2023)

NAME OF TEACHER: Hemant Kumari

SUBJECT: - MATHEMATICS

CLASS– BACHELOR OF SCIENCE/ARTS (SEM- III)

PAPER: Linear Programming & mechanics

Sr. no	Weekly	Subject matter
1	1ST TO 5TH SEPT.	Linear Programming: Formation of LPP, Graphical Method. Theory of the Simplex Method, Standard form of LPP.
2	7th TO 12TH SEPT.	Feasible solution to basic feasible solution, Improving BFS, Optimality Condition, Unbounded solution, Alternative optimal solution, Correspondence between BFS and extreme points.
3	14th TO 19TH SEPT.	Simplex Method, Simplex Algorithm, Simplex Tableau. Simplex Method Case of Degeneracy,
4	21 ist TO 26TH SEPT.	Big-M Method, Infeasible solution, Alternate solution, Solution of LPP for unrestricted variable.
5	28th TO 3rd OCT.	Transportation Problem: Formation of TP, Concepts of solution, feasible solution,
6	5th TO 10TH OCT.	Finding Initial Basic Feasible Solution by North West Corner Method, Matrix Minima Method,.
7	12th TO 17TH OCT.	Vogel's Approximation Method. Optimal Solution by MODI method, Unbalanced and maximization type of TP.
8	19th TO 24TH OCT.	Assignment Problem: Maximization, Minimization, Unbalances, With restriction Assignment problems, Algorithm, Hungarian method
9	26th TO 31 ist OCT.	Statics: Basic notation, Newton Laws of motion, system of two forces, parallelogram law of forces, resultant of two collinear forces, resolution of forces, moment of a force, couple.
10	16th TO 21Th November.	theorem on moments of a couple, coplanar forces, resultant of three coplanar concurrent forces, theorem of resolved parts, resultant of two forces acting on a rigid body. Varignon's theorem, generalized theorem of moments.
11	23rd TO 28Th November.	Equilibrium of two concurrent forces, equilibrium condition for any number of coplanar concurrent forces, Lami's theorem. -u theorem, theorems of moments, resultant of a force and a couple. Equilibrium conditions for coplanar non-concurrent forces.
12	30th TO 5Th December	**MST Exams**

GOVT. SHIVALIK COLLEGE NAYA NANGAL

TEACHING PLAN (SESSION 2022-2023)

NAME OF TEACHER: Hemant Kumari

SUBJECT: - MATHEMATICS

CLASS– BACHELOR OF SCIENCE/ARTS (SEM- IV)

PAPER: Numerical methods and Number theory

Sr. no	Weekly	Subject matter
1	1-6 Feb.	Measures of Errors: Relative, absolute and percentage errors.
2	8-13 Feb.	Types of errors: Inherent error, Round-off error and Truncation error.
3	15-20Feb.	Bisection method, Regula-Falsi method, Secant method, Fixed-point iteration, Intermediate value theorem.
4	22-27 Feb.	Iteration methods based on first degree equation: Newton-Raphson method, Birge-Vieta method, Bairstow method.
5	1-6 March	Linear System of Equations: Gauss-Elimination method, Pivot element, Pivoting strategies, Partial and complete Pivoting.
6	8-13 March	Gauss Jordan and Triangularization method, Jacobi Method.
7	15-20 March	Gauss Seidel Method, Eigen value problem. Interpolation.
8	22 Mar to3 Apr.	Finite differences, Divided differences, Newton Gregory Forward and Backward formula, Lagrange's Formula, Newton's Formulae.

9	**5-17 April.**	Central Differences, Stirling, Bessel's and Everett's formulae, Error in linear and quadratic interpolation.
10	**19-24 April**	Divisibility, Greatest common divisor, Fundamental Theorem of arithmetic.
11	**26 April to 4May**	congruence, residue classes and reduced residue classes, Euler-Fermat theorem, Wilsons's theorem, Linear congruence, Chinese Remainder theorem.
12		**MST Exams**

Signature of teachers

GOVT. SHIVALIK COLLEGE NAYA NANGAL

TEACHING PLAN (SESSION 2022-2023)

NAME OF TEACHER: Hemant Kumari

SUBJECT: - MATHEMATICS

CLASS– BACHELOR OF SCIENCE/ARTS (SEM- V)

PAPER: Methamatical methods-I & Descrete-I

Sr. no	Weekly	Subject matter
1	1ST TO 5TH SEPT.	Definition of Laplace transform, linearity property- Piecewise continuous function Existence of Laplace transform.
2	7th TO 12TH SEPT.	Functions of exponential order and of class A First and second shifting theorems of Laplace transform, Change of scale property- Laplace transform of derivatives.
3	14th TO 19TH SEPT.	Initial value problems, Laplace transform of integrals, Multiplication by 1. Division by Laplace transform of periodic functions and error function; Beta function and Gamma functions.
4	21 ist TO 26TH SEPT.	Definition of Inverse Laplace transform, Linearity property, First and second shifting theorems of inverse Laplace transform, Change of scale property.
5	28th TO 3rd OCT.	Division by p. Convolution theorem, Heaviside's expansion formula (with proofs and applications).
6	5th TO 10TH OCT.	Applications of Laplace transforms: Applications of Laplace transforms to the solution of ordinary differential equations with constant coefficients and variable coefficients.
7	12th TO 17TH OCT.	Simultaneous ordinary differential equations.
8	19th TO 24TH OCT.	Second order Partial differential equations (Heat Equation, Wave Equation and the Laplace equation).
9	26th TO 31 ist OCT.	Graphs and Planar Graphs-Basic Terminology Multi graphs.

10	**16th TO 21Th November.**	Weighted Graphs. Paths and Circuits Shortest paths. Eulerian Paths and Circuits.
11	**23rd TO 28Th November.**	Travelling Salesman Problem. PlanarGraphs Trees.
12	**30th TO 5Th December**	**MST Exams**

Signature of teachers

GOVT. SHIVALIK COLLEGE NAYA NANGAL

TEACHING PLAN (SESSION 2022-2023)

NAME OF TEACHER: Hemant Kumari

SUBJECT: - MATHEMATICS

CLASS– BACHELOR OF SCIENCE/ARTS (SEM- VI)

PAPER: Methamatical methods-II & Descrete-II

Sr. no	Weekly	Subject matter
1	1-6 Feb.	Fourier series Fourier series, Theorems, Dirichlet's conditions, Fourier series for even and odd functions, Half range Fourier series.
2	8-13 Feb.	Other forms of Fourier series Hankel Transform Hankel integral formula, Hankel transform, Inverse Theorem for Hankel transform, Hankel sine and cosine transforms and their inversion formulac Linearity property of Hankel transforms.
3	15-20Feb.	Change of scale property Fourier transforms and its applications: Dirichlet's conditions, Fourier integral formula (without proof) Fourier transform.
4	22-27 Feb.	Inverse Theorem for Fourier transform, Fourier sine and cosine transforms and their inversion formulae. Linearity property of Fourier transforms, Change of scale property.
5	1-6 March	Shifting theorem, Modulation theorem, Convolution theorem of Fourier transforms. Parseval's identity.
6	8-13 March	Finite Fourier sine transform, Inversion formula for sine transform, Finite Fourier cosine Transform, Inversion formula for cosine transform.
7	15-20 March	Applications to solve some model equations: One dimensional heat equation, one dimensional wave equation.
8	22 Mar to3 Apr.	Analysis of Algorithms-Time Complexity. Complexity of Problems.

9	**5-17 April.**	Discrete Numeric Functions and Generating Functions.
10	**19-24 April**	Recurrence Relations and Recursive Algorithms Linear Recurrence Relations with Constant Coefficients.
11	**26 April to 4May**	Homogeneous Solutions Particular Solution Total Solution Solution by the Method of Generating Functions.
12		**MST Exams**

Signature of teachers

Govt Shivalik College Naya Nangal

Teaching Plan Session (2022-23)

Class :- M.A I (Sem I).

Paper :- Basic Qnantative Methods

Subject:- Economics

Name of Teacher :- Hemant Kumari

Sr. No	Dates	Topics
1.	1-6 February	Calculus: Concept of differentiation. Differentiation of function of one variable including logarithmic and exponential functions.
2.	8-13 February	Successive and partial derivatives. Euler's theorem. Elementary Concepts of Integration: Integration of function of one variable.
3.	15-20 February	Applications of Revenue and cost function, Analysis of Consumer's surplus and Producer's Surplus.
4	22-27 February	Applications of Derivatives in Economics: Elasticity of demand, Average and marginal functions.
5	01-06 March	Elementary Concepts of Integration: Integration of function of one variable.
6	08-13 March	Problems of optimization (maxima /minima) in case of one variable.
7	15-20 March	Matrices: Definition and types. Elementary operations. Rank of a matrix.
8	22-27 March	Matrix inverse by adjoint and Linear Equation method. Concept of determinants and its properties.
9	29-03 April	Concept of determinants and its properties.
10	05-10 April	Solution of simultaneous Equations by Cramer's Rule and Matrix Inverse methods and proving problems.
11.	12-17 April	Applications of simultaneous equations in Economics
12.	19-24 April	Arithmetic and Geometric Progression: Elementary idea and their economic applications.
13.	26-04 May	MST Exams...

Teaching plan Session (2022-23)

Class :- M.A sem II. **Name of Teacher:- Hemant Kumari**

Subject :- Mathematics. **Name of Paper :- Basic quantitative methods**

Sr. No.	Date(Weekly)	Subject related syllabus
1	1-6 Feb.	Concepts of Geometric Mean, Harmonic Mean and their applications,
2	8-13 Feb.	Measures of Dispersion including Lorenz Curve. Skewness: Meaning, types and measures.
3	15-20Feb.	Probability; definition, concepts, Addition and Multiplication theorems and their applications.
4	22-27 Feb.	Correlation and Regression: Correlation: Definition, types, causation, Methods of correlation
5	1-6 March	Discrete and Continuous Variables; Properties of correlation, Rank Correlation and its applications, and Concurrent Deviation Method.
6	8-13 March	Regression Analysis: Meaning, types, difference between Correlation and Regression, Methods of obtaining.
7	15-20 March	Regression Equations in case of two Variables only, Properties of Regression Coefficients, Discrete and Continuous Variables
8	22 Mar to3 Apr.	Interpolation and Extrapolation: Binomial Expansion Method, Newton's Method for Leading Differences and Lagrange's Method.
9	5-17 April.	Index numbers: Meaning, types, problems and methods of construction of Index Numbers.
10	19-24 April	Chain and Fixed Base Index Number, Tests of Consistency and Cost of living Index Numbers.
11	26 April to 4May	Time Series Analysis: Components of Time Series and its Measurement of Secular.
12		**Revision & M.S.T.**

GOVT SHIVALIK COLLEGE , NAYA NANGAL

WORK LOAD (SESSION 2022-2023)

(Prof. HEMANT KUMARI , Mathematics Dept.)

CLASS	PERIOD NO.	TIME	DAYS	NO. OF PERIODS
M.A -1	1	9.00a.m-9.45a.m	(1-6)	6
B.Sc I/B.A I	2	9:45a.m-10:30a.m	(1-6)	6
B.ScII/B.A II	4	11:15a.m-12:00 noon	(1-6)	6
B.Sc/B.A III	5	12:00p.m-12:45p.m	(1-6)	6

TOTAL-24

Prof. Hemant Kumari

Department of Mathematics