

### Teaching Plan (Session 2020-21)

Class:- B.Sc./B.A. (Sem-III)      Name of Teacher:-                      Hemant Kumari

Subject:- Mathematics. Name of Paper: Advanced Calculus- & Statics

Sr. No.	Date(Weekly)	Subject related syllabus
1	1-5 Sep.	Limit and Continuity of Functions of several variables. Differentiability of real-valued functions of two variables.
2	7-12 Sep.	Partial differentiation, Jacobians and their properties, Schwarz's & Young's theorems.
3	14-19 Sep	Euler's theorem on homogenous functions. Taylor's theorem for functions two variables and error estimation.
4	21-26 Sep	Maxima and Minima, Lagrange's multiplier method.
5	28 Sep to 3 Oct.	Double and Triple Integrals, Change of order of integration in double integrals, Change of variables.
6	5-10 Oct	Applications to evaluation of areas, Volume, Centre of Gravity and Moments of Inertia
7	12-17 Oct.	The previous knowledge of the students in Calculus of one variable should lead to effective strategy in the introduction of the concepts of several variables
8	26-31 Oct.	<b>Statics:</b> 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.
9	2-7 Nov.	Couple, theorem on moments of a couple, coplanar forces,
10	8-14 Nov.	Resultant of three coplanar concurrent forces, theorem of resolved parts, resultant of two forces acting on a rigid body.
11	16-21 Nov.	Varignon's theorem, generalized theorem of moments.
12	23 Nov. to 3 Dec.	Revision and M.S.T. Exam.



### Teaching Plan (Session2020-21)

Class :- B.Sc./B.A. (Sem- IV)      Name of Teacher:- Hemant Kumari

Subject :- Mathematics.      Name of Paper:- Numerical Methods & Dynamics

Sr. No.	Date(Weekly)	Subject related syllabus
1	1-6 Feb.	SECTION –A Bisection Method, Regula-falsi method, Sectant method, Fixed – point iteration.
2	8-13 Feb.	Newton–Raphson method and convergence of Secant, Newton– Raphson method and fixed-point iteration.
3	15-20Feb.	Pivoting strategies, Partial Pivoting, Gauss–Elimination, Gauss Jordan and Triangularisation method.
4	22-27 Feb.	Jacobi Method, Gauss Seidel Method. <b>SECTION-B</b> <b>Interpolation:</b> Finite differences.
5	1-6 March	Divided differences, Newton Gregory Forward and Backward formula,
6	8-13 March	Lagrange’s formula, Newton’s formulae, Central Differences, Stirling, Bessel’s and Everett’s formulae, Error in linear and quadratic interpolation.
7	15-20 March	Motion of a particle with constant acceleration, acceleration of falling bodies, motion under gravity.
8	22 Mar to3 Apr.	Motion of a body projected vertically upward, motion of a two particles connected by a string, motion along a smooth inclined plane.
9	5-17 April.	Constrained motion along a smooth inclined plane. Variable acceleration, Simple harmonic motion, elastic string, simple pendulum.
10	19-24 April	Revision
11	26 April to 4May	M.S.T.



### Teaching Plan (Session 2020-21)

Class :- B.Sc./B.A. (Sem- I)      Name of Teacher:- Hemant Kumari

Subject :- Mathematics.      Name of Paper :- Calculus-1 & Linear Algebra

Sr. No.	Date(Weekly)	Subject related syllabus
1	1-5 Sep.	Differential Calculus: $\epsilon$ - $\delta$ definition of the limit of a function. Basic properties of limit
2	7-12 Sep.	Continuous functions and classification of discontinuities. Differentiability, Derivative of nth order
3	14-19 Sep	Leibnitz theorem, Asymptotes. Test for concavity and convexity
4	21-26 Sep	Points of Inflection, Tracing of Curves 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 differentiability of two variables.
6	5-10 Oct	Partial derivatives and its Linearization, Chain rule, Partial derivative with respect to a variable
7	12-17 Oct.	Homogeneous functions, Euler theorem and its applications, Extreme value and saddle point, Lagrange multiplier,
8	26-31 Oct.	Taylor's theorem and its linear and quadratic approximation.
9	2-7 Nov.	Elementary 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 equivalence 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.	<b>Revision &amp; M.S.T.</b>



### Teaching Plan (Session 2020-21)

Class :- B.Sc./B.A. (Sem-II)

Name of Teacher:-

Hemant Kumari

Subject :- Mathematics.

Name of Paper;-

Calculus-2& 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	<b>Section-B</b> <b>Sphere:</b> 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.	<b>Cone:</b> general second degree equation of a cone, its intersection with a plane and with a line, enveloping cone, right circular cone, the cone $ax^2 + by^2 + cz^2 = 0$
10	19-24 April	<b>Cylinder:</b> enveloping cylinder, right circular cylinder.
11	26 April to 4May	Revision
12	1-6 Feb.	M.S.T.



### Teaching Plan (Session 2020-21)

Class :- B.Sc./B.A. (Sem-V)

Name of Teacher:-

Hemant Kumari

Subject :- Mathematics.

Name of Paper;-

Mathematical Method-1 &  
Discrete 1

Sr. No.	Date(Weekly)	Subject related syllabus
1	1-5 Sep.	<b>Fourier series</b> : Fourier series, Theorems, Dirichlet's conditions, Fourier series for even and odd functions.
2	7-12 Sep.	Half range Fourier series, Other forms of Fourier series.
3	14-19 Sep	<b>Laplace transforms</b> : Definition of Laplace transform, linearity property- Piecewise continuous function.Existence of Laplace transform.
4	21-26 Sep	Functions of exponential order and of class A. First and second shifting theorems of Laplace transform, Change of scale property.
5	28 Sep to 3 Oct.	Laplace transform of derivatives, Initial value problems, Laplace transform of integrals.
6	5-10 Oct	Multiplication by $t$ , Division by $t$ , Laplace transform of periodic functions and error function, Beta function and Gamma functions.
7	12-17 Oct.	Definition of Inverse Laplace transform, Linearity property, First and second shifting theorems of inverse Laplace transform, Change of scale property.
8	26-31 Oct.	Division by $p$ , Convolution theorem, Heaviside's expansion formula (with proofs and applications).
9	2-7 Nov.	<b>SECTION-B</b> Graphs and Planar Graphs–Basic Terminology. Multigraphs. Weighted Graphs. Paths and Circuits Shortest paths. Eulerian Paths and Circuits. Travelling Salesman Problem.
10	8-14 Nov.	Planar Graphs. Trees. Definition and Examples of Finite State Machines–Equivalent Machines and Finite State Machines as Language Recognizers.
11	16-21 Nov.	Revision.
12	23 Nov. to 3 Dec.	M.S.T. Exam.



### Teaching Plan (Session 2020-21)

Class :- B.Sc./B.A. (Sem-VI)

Name of Teacher:-

Hemant Kumari

Subject :- Mathematics.

Name of Paper;-

Mathematical Method-2 &  
Discrete 2

Sr. No.	Date(Weekly)	Subject related syllabus
1	1-6 Feb.	<b>Section- A Fourier transforms</b> : Dirichlet's conditions, Fourier integral formula (without proof), Fourier transform, Inverse Theorem for Fourier transform.
2	8-13 Feb.	Fourier sine and cosinetransforms and their inversion formulae. Linearity property of Fourier transforms, Change of scale property, Shifting theorem, Modulation theorem.
3	15-20Feb.	Convolution theorem of Fourier transforms, Parseval's identity, Finite Fourier sine transform. Inversion formula for sine transform, Finite Fourier cosine Transform, Inversion formula for cosine transform.
4	22-27 Feb.	<b>Section- B Applications of Laplace and Fourier transforms:</b> Applications of Laplace transforms to the solution of ordinary differential equations with constant coefficients.
5	1-6 March	Variable coefficients, Simultaneous ordinary differential equations, Second order Partial differential equations ( Heat, wave and laplace).
6	8-13 March	<b>SECTION-B( DISCRETE-2)</b> Brief review of Groups and Rings. Boolean Algebras- Lattices and Algebraic Structures.
7	15-20 March	Duality. Distributive and Complemented Lattices. Boolean Lattices and Boolean Algebras.
8	22 Mar to 3 Apr.	Boolean Functions and Expressions. Design and Implementation of Digital Networks.
9	5-17 April.	Propositional Calculus.
10	19-24 April	Switching Circuits.
11	26 April to 4May	Revision
12	1-6 Feb.	M.S.T.

