



**PREM CHAND MARKANDA COLLEGE FOR WOMEN,
JALANDHAR CITY**

Re-accredited 'A+' grade (2nd Cycle) by NAAC Bangalore

A unique prestigious Post Graduate Institution of Northern India

COURSE PLAN

Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-I

Faculty Name- Mrs. Shveta Mahajan

Subject- Algebra

Month	Topic	Teaching Tools
July	Relations between the roots and coefficients of general polynomial equation in one variable. Transformation of equations	Group teaching, and learning through problem-solving. Expeditionary Learning
August	Transformation of equations Descarte's rule of signs with illustrations.	Learning through Problem solving, analytical learning, learning through practical examples.
September	Solution of cubic equations by Cardon method, Solution of biquadratic equations by Ferrari's Methods, Partitioning of Matrices, Matrices Partitioned conformably for Multiplication.	Learning through Problem solving, analytical learning, Participative learning using previous knowledge
September	Linear independence of row and column vectors. Row rank, Column rank of a matrix, Equivalence of column and row ranks, Nullity of matrix,	Group teaching, and learning through problem-solving. Expeditionary Learning
October	Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations. Theorems on consistency of a system of linear equations.	Participative learning through quiz
October	Eigen values, Eigen vectors, minimal and the characteristic equation of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix, Quadratic Forms, quadratic form as a product of matrices. The set of quadratic forms over a field. Congruence	Interactive learning through encouraging students to explain their reasoning

	of quadratic forms and matrices. Congruent transformations of matrices. Elementary congruent transformations. Congruent reduction of a symmetric matrix. Reduction in the real field. Classification of real quadratic forms in n variables. Definite, semi-definite and indefinite real quadratic forms.	
November	Characteristic properties of definite, semi-definite and indefinite forms.	Participative learning through power point presentation

Course Outcomes:

CO.1	At the end of the Semester, Students are able to solve system of linear equations and obtain Eigen values, Eigen vectors, minimal and characteristic equation of a matrix
CO.2	Students are able to classify real quadratic form in variables, definite, semi-definite and indefinite real quadratic form
CO.3	Students are able to understand the concept of matrix congruence of skew symmetric matrices and its reduction in real field.
CO.4	Students are able to find the relations between the roots and coefficients of general polynomial equation in one variable.
CO.5	Students are able to distinguish between solution of cubic equations and Bi-quadratic equations.



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Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-I

Faculty Name- Mrs. Shveta Mahajan

Subject- Algebra Laboratory

Month	Topic	Teaching Tools
July	Introduction to the computer package in the practicals	Hands on practice using MATLAB software
August	Matrix operations: addition, multiplication, inverse, transpose, determinant of matrix	Hands on practice using MATLAB software
September	Rank of matrix: Row Rank, Column Rank. Create the coefficient matrix A and vector b. Solve for x using the inverse, using the builtin function.	Hands on practice using MATLAB software
October	Solving a linear system, using Gauss elimination numerically. Finding eigenvalues and eigenvectors, numerically.	Hands on practice using MATLAB software
November	Practice of above topics.	Hands on practice using MATLAB software

Course Outcomes:

At the end of the Semester, Students are able to solve problems related to matrices using MATLAB software.



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COURSE PLAN

Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-III

Faculty Name- Mrs. Sonia Sharma

Subject- Analysis

Month	Topic	Teaching Tools
July	Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion.	Learning through Problem solving, analytical learning
August	Series of non-negative terms. Comparison tests. Cauchy's integral test. Ratio test. Cauchy's root test. Logarithmic test. Cauchy condensation test, Gauss test, Alternating series. Leibnitz's test. Absolute and conditional convergence.	Group teaching, and learning through problem-solving. Expeditionary Learning
September	Partitions, Upper and lower sums. Upper and lower integrals, Riemann integrability. Conditions of existence of Riemann integrability of continuous functions and of monotone functions. Algebra of integrable functions.	Learning through Problem solving, analytical learning
October	Improper integrals and statements of their conditions of existence. Test of the convergence of improper integral,	Interactive learning through encouraging students to explain their reasoning
November	Beta and Gamma functions.	Learning through Problem solving, analytical learning

Course Outcomes:

CO.1	At the end of the Semester, Students are able to demonstrate an understanding of limits and how they are used in sequences and series.
CO.2	Students are able to distinguish between the absolute convergence and conditional convergence.
CO.3	Students are able to know and describe the converging behavior of improper integrals and Beta , Gamma functions.
CO.4	Students are able to find the relation between Beta and Gamma functions.
CO.5	Students are able to understand the concept of Riemann sum, partitions, upper and lower sums, Riemann integrability of continuous functions and of monotone functions.



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COURSE PLAN

Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-III

Faculty Name- Mrs. Shveta Mahajan

Subject- Analytical Geometry

Month	Topic	Teaching Tools
July	Transformation of axes, shifting of origin, Rotation of axes in two dimension and three dimension, The invariants,	Group teaching, and learning through problem-solving. Expeditionary Learning Learning through Problem solving, analytical learning
August	Joint equation of pair of straight lines, equations of bisectors, Parabola and its properties.	Learning through Problem solving, analytical learning
August	Tangents and normals, Pole and polar, pair of tangents at a point, Chord of contact, equation of the chord in terms of mid point and diameter of conic	Group teaching, and learning using previous knowledge, Expeditionary Learning
September	Ellipse and hyperbola with their properties, Tangents and normals, Pole and polar, pair of tangents at a point, Chord of contact, Identifications of curves represented by second degree equation (including pair of lines).	Participative learning through Quiz and assignments.
October	Sphere: Section of a sphere by a plane, spheres of a given circle. Intersection of a line and a sphere. Tangent line, tangent plane, power of a point w.r.t. a sphere, radical planes.	Interactive learning through encouraging students to explain their reasoning
November	Intersection of three planes, condition for three planes to intersect in a point or along a line or to form a prism,	Participative learning through using examples from real life

Course Outcomes:

CO.1	At the end of the Semester, Students are able to understand the concept of the geometry of lines and conics in the Euclidian plane.
CO.2	Students are able to demonstrate the concept of parabola, ellipse, hyperbola, sphere and the general quadratic equation.
CO.3	Students are able to sketch conic sections; identify conic sections, their focal properties and classifications.
CO.4	Students are able to understand the concept of coordinate and solid geometry on a wider scale with the help of shifting of origin and rotation of axis.
CO.5	Students are able to understand the concepts of plane.



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COURSE PLAN

Department- Mathematics

Session-2024-25

Class- B.A./B.Sc. (Eco, Non Med)

Semester-V

Faculty Name- Mrs. Shveta Mahajan

Subject- Dynamics

Month	Topic	Teaching Tools
July	Rectilinear motion in a straight line with uniform acceleration,	Participative learning using practical examples from real life
August	Newton's laws of motion, Motion of two particles connected by a string, Motion along a smooth inclined plane, Variable acceleration, Simple Harmonic Motion.	Participative learning using practical examples from real life
September	Curvilinear motion of particle in a plane, Definition of velocity and acceleration, projectiles, Oscillations: Free Vibrations, Simple Pendulum, Conical Pendulum	Group teaching, and learning through problem-solving. Expeditionary Learning
October	Work, Power and Energy: Kinetic and Potential energy, Conservative forces. Theorem of conservation of energy.	Participative learning using practical examples from real life
November	Work done against gravity	Participative learning through quiz and assignments

Course Outcomes:

CO.1	At the end of the Semester, Students are able to explain the relationship between forces and motion. Understand Newton's Laws of Motion and Apply the laws to solve many problems.
CO.2	Students are able to discuss the motion of particles connected by a string, motion along a smooth inclined plane.
CO.3	Students are able to solve different types of problems with Variable Acceleration.
CO.4	Students are able to discuss Simple Harmonic Motion and Illustrate it with a variety of examples.
CO.5	Students are able to solve Pendulum, Damped and forced Oscillations oscillating system problems.
CO.6	Students are able to define Work, Power and Energy and Explain their relationship. Use measurement tools to apply the concepts of Work and power to solve real life problems.
CO.7	Students are able to define Energy and Identify the different types that exist



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COURSE PLAN

Department- Mathematics

Session-2024-25

Semester-V

Class- B.A./B.Sc. (Eco, Non Med)

Faculty Name- Mrs. Sonia Sharma

Subject- Number Theory

Month	Topic	Teaching Tools
July	Preliminaries: Proof by induction, Binomial Theorem. Divisibility in Integers: Basic Definitions and Properties, The division Algorithm,	Group teaching, and learning using previous knowledge,
August	GCD, The Euclidean Algorithm, LCM, Existence and determination of solution to the linear Diophantine equation $ax + by = c$, primes-definition & Properties, the fundamental theorem of Arithmetic..	Participative learning using quiz and assignments
August	Number-theoretic functions: the greatest integer function, Euler's Phi-function, Sum & number of divisors functions, function & the Inversion formula.	Group teaching, and learning using previous knowledge, Expeditionary Learning
September	Congruences-definition and properties, linear congruences, existence & solution of the linear congruence, , Complete and reduces residue systems, Chinese remainder theorem.	Group teaching, and learning using previous knowledge,
October	Fermat's theorem, Euler's theorem, Pseudoprimes Wilson's theorem. Application	Expeditionary Learning and participative learning through

	to Cryptography-Factorization methods due to Fermat	quiz
November	RSA.	Participative learning usings examples from real life

Course Outcomes:

CO.1	At the end of the Semester, Students are able to prove results involving divisibility and greatest common divisors.
CO.2	Students are able to solve system of linear congruences and find solutions of specified linear Diophantine equation.
CO.3	Students are able to apply Fermat's ,Euler's and Wilson's theorem to prove relation involving prime numbers.
CO.4	Students are able to understand and apply properties of phi functions in real world problems.
CO.5	Students are able to understand application of important arithmetic functions



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COURSE PLAN

Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-II

Faculty Name- Mrs. Shveta Mahajan

Subject- Calculus

Month	Topic	Teaching Tools
January	Derivatives of Hyperbolic and Inverse Hyperbolic functions, nth order derivatives, Leibnitz theorem on nth derivative and its applications, Indeterminate forms and L'Hospital rule.	Participative learning through checking students' previous knowledge
February	Application of Taylor's theorem in error estimation; Taylor's series expansions of $\sin x$, $\cos x$, e^x , $\log x$ etc. Asymptotes, Horizontal Asymptotes, Vertical Asymptotes, Oblique Asymptotes, Asymptotes of general Rational Algebraic Curve with illustrations, Intersection of curve and its Asymptotes, de Moivre's theorem (for integer and Rational index) and its applications, primitive nth roots of unity	Learning through Problem solving, analytical learning
March	Integration of hyperbolic functions, Properties of definite integral, Reduction formulae of type $\int \tan^n x dx$, $\int \cot^n x dx$, $\int \sec^n x dx$, $\int \operatorname{cosec}^n x dx$, $\int x \cos^n x dx$, $\int \cos^m x \sin nx dx$ Reduction formulae using Rule of Smaller index +1 of type	Participative learning through

	$\int_0^{\pi/2} \cos^n x \, dx, \int_0^{\pi/2} \cos^n x \, dx, \int_0^{\pi/2} \cos^m x \sin^n x \, dx .$	quiz
April	Real number system and its order properties: lub, glb of sets of real numbers, Completeness property, Archimedean property, Dense property of Rational numbers, Limit of a function of real variable, Properties of Limits, Squeeze Theorem, Continuous function and classification of discontinuities, Differentiability of a function of real variable, Concavity and Convexity of function, Point of inflexion.	Interactive learning through encouraging students to explain their reasoning

Course Outcomes:

CO.1	At the end of the Semester, Students are able to demonstrate Asymptotes, points of inflexion, multiple points on a curve & also to differentiate between concavity and convexity & hence tracing of curve.
CO.2	Students are able to apply reduction formula on different functions & to develop the concept of variation of parameter.
CO.3	At the end of the Semester, Students are able to understand real number system, lub & glb of set of real numbers, limit of a function, basic properties of limit
CO.4	Students are able to analyse continuous and discontinuous function, Apply concept of continuity in uniform continuity.
CO.5	Students are able to solve problems related to successive differentiation, Leibnitz theorem, Taylor's & Maclaurin's theorem with various forms of remainders and to use these expansion to compute values of Sine, Cosine, tangent or log function.
CO.6	Students are able to understand the concept of De Moivre's theorem & its applications. Identify circular, hyperbolic function and their inverses.



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Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-II

Faculty Name- Mrs. Shveta Mahajan

Subject- Calculus Laboratory

Month	Topic	Teaching Tools
January	Plotting graphs of elementary functions $ax+b$, $\sin(bx+c)$, $\log(ax+b)$, $1/(ax+b)$, $\sin(ax+b)$, $\cos(ax+b)$, $ ax+b $ and to illustrate the effect of a and b on the graphs.	Hands on practice through software MATLAB
February	Plotting the graphs of the polynomial of degree 4 and 5, the derivative graph, the second derivative graph, Tracing of conics in Cartesian coordinates and using the general equation of second degree in x and y .	Hands on practice through software MATLAB
March	Tracing of conicoids: Ellipsoid, Hyperbolic paraboloid, Elliptic paraboloid, Hyperboloid of one and two sheets etc., Graphs of hyperbolic functions.	Hands on practice through software MATLAB
April	Approximation of limit. Approximations of derivatives.	Hands on practice through software MATLAB

Course Outcomes:

At the end of the Semester, Students are able to plot the given graphs using MATLAB software.



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Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-IV

Faculty Name- Mrs. Shveta Mahajan

Subject- Statics and Vector Calculus

Month	Topic	Teaching Tools
January	Composition and resolution of forces (parallelogram law, triangle law, polygon law, Lami's Theorem, λ - μ theorem, Resultant of a number of coplanar forces, parallel forces. Moments, Varignon's theorem of moments, Couples, Resultant of two Coplanar Couples, Equilibrium of two coplanar couples, Resultant of a force and a couple. Equilibrium of coplanar forces	Group teaching, and learning through problem-solving. Expeditionary Learning Learning through Problem solving, analytical learning
February	Friction, Laws of friction, Equilibrium of a particle on a rough plane. Centre of Gravity: Centre of gravity of a rod, triangular lamina, solid hemisphere, hollow hemisphere, solid cone and hollow cone	Participative learning using practical examples from real life
March	Vector differentiation, Gradient, divergence and curl operators, line integrals, Vector identity, Vector integration	Group teaching, and learning using previous knowledge, Expeditionary Learning
April	Theorems of Gauss, Green, Stokes and problems based on these	Participative learning through Quiz and assignments.

Course Outcomes:

CO.1	At the end of the Semester, Students are able to apply parallelogram law of forces, triangle law of forces, Lami's theorem to real life problems
CO.2	Students are able to understand that how one can resolve number of coplanar forces, parallel forces and concurrent forces acting at a body.
CO.3	Students are able to find the moments of number of coplanar forces acting at a particle.
CO.4	Students are able to find the resultant of a force and couple acting on a body.
CO.5	Students are able to find the applications of CG of a rod, triangular lamina, solid hemisphere, hollow hemisphere, solid cone and hollow cone.
CO.6	Students are able to find the values of gradient, divergence and curl operator of given vectors.
CO.7	Students are able to find the application of Gauss theorem, Green's theorem and Stokes's theorem in real life problems.



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Department- Mathematics

Session-2024-25

Class- B.Sc. (Eco, Non Med, C.Sc.)/ B.A. B.Ed.

Semester-IV

Faculty Name- Mrs. Sonia Sharma

Subject- Solid Geometry

Month	Topic	Teaching Tools
January	Cylinder as surface generated by a line moving parallel to a fixed line and through fixed curve. Different kinds of cylinders such as right circular, elliptic, hyperbolic and parabolic in standard form	Expeditionary Learning and participative learning through quiz
February	Cone with a vertex at the origin as the graph of homogeneous equation of second degree in x, y, z. Cone as a surface generated by a line passing through a fixed curve and fixed point outside the plane of the curve, right circular and elliptic cones.	Participative learning using practical examples from real life
March	Equation of surface of revolution obtained by rotating the curve $f(x,y)=0$ form of about the z-axis in the form $f(x^2 + y^2, z)=0$. Equation of ellipsoid, hyperboloid and paraboloid in standard forms.	Group teaching, and learning using previous knowledge, Expeditionary Learning
April	Surfaces represented by general equation of 2nd degree $S = 0$. Tangent lines, tangent planes and Normal plane.	Group teaching, and learning using previous knowledge,

Course Outcomes:

CO.1	At the end of the Semester, Students are able to demonstrate the concept of cone, classification of cone, intersection of line and cone, reciprocal cone.
CO.2	Students are able to understand the concept of cylinder, enveloping cylinder and its limiting form.
CO.3	Students are able to describe the concept of conicoids or quadratic surface, its classification, trace different types of conicoids.
CO.4	Students are able to manage to find surface of revolution and concept of tangent and normal to the conicoids.
CO.5	Students are able to identify the conicoids and representing it in the form of hyperboloid, ellipsoid, paraboloid.



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COURSE PLAN

Department- Mathematics

Session-2024-25

Class- B.A./B.Sc. (Eco, Non Med)

Semester-VI

Faculty Name- Mrs. Shveta Mahajan

Subject- Linear Algebra

Month	Topic	Teaching Tools
January	Definition of groups, rings and fields with examples. Definition of a vector space, subspaces with examples.	Participative learning using previous knowledge
February	Direct sum of subspaces. Linear span, Linear dependence, Linear independence of vectors. Linear combination of vectors. Basis of a vector space.	Learning through Problem solving, analytical learning
March	Finitely generated vector spaces. Existence theorem for basis. Invariance of the number of elements of the basis set. Dimension of sum of two subspaces. Quotient space and its dimension	Learning through Problem solving, analytical learning
April	Linear transformation. Algebra of linear transformation. Rank- Nullity theorem, Isomorphism and Isomorphic spaces. Finitely generated vector spaces. Existence theorem for basis.	Learning through Problem solving, analytical learning

Course Outcomes:

CO.1	At the end of the Semester, Students are able to express the algebraic concepts such as binary operation, groups, rings and fields.
CO.2	Students are able to define a vector space and subspace of a vector space.
CO.3	Students are able to check the linear dependence and linear independence of vectors.
CO.4	Students are able to describe the concepts of basis and dimension of vector spaces.
CO.5	Students are able to investigate properties of vector spaces and subspaces using linear transformation.
CO.6	Students are able to perform algebra operations between linear transformations.
CO.7	Students are able to find the matrix representing a linear transformation.



Department- Mathematics

Session-2023-24

Class - B.A./B.Sc. (Eco, Non Med)

Semester-VI

Faculty Name- Mrs. Sonia Sharma

Subject- Numerical Analysis

Month	Topic	Teaching Tools
January	Error generation, propagation, error estimation and error bounds, Solution of non-linear equations, Bisection method, Iteration method, Newton's Method, Generalized Newton's Method, Method of false position,	Participative learning through practical examples
February	Muller's method, Rate of convergence of these methods. Solution of linear system of equation; Direct method, Gauss elimination variant (Gauss Jordan and Crout reduction), Triangular Method, Iterative Method, Jacobi's Method, Gauss Seidel Method.	Participative learning through practical examples
February	Finite Differences: Forward, Backward, Central, Divided differences, shift operator, relationship between the operators and detection of errors by use of difference operator	Participative learning through practical examples
March	Interpolation with divided difference, Newton's formula, Lagrangian Method, Finite difference interpolation, Gauss formula, Stirling formula, Bessel's formula, Error Estimation, Extrapolation. Numerical differentiation, Method based on interpolation. Numerical Integration, Trapezoidal rule, Simpson's rule, Weddle rule, Romberg Integration	Participative learning through practical examples
April	Gaussian integration method, Gaussian legendre integration. Double numerical integration. Numerical solution of ordinary differential equations, Initial value problem, Taylor's method, Euler's methods, Picard's method, Milne's Method, Runge-Kutta Method. Predictor- Corrector's Method	Participative learning through practical examples

Course Outcomes:

CO.1	At the end of the Semester, Students are able to perform computation for solving a system of equations.
CO.2	Students are able to know how to find the roots of transcendental equations.
CO.3	Students are able to learn how to interpolate the given set of values.
CO.4	Students are able to understand the curve fitting for various polynomials.
CO.5	Students are able to learn numerical solution of differential equations.
CO.6	Students are able to compute numerical integration and differentiation, numerical solution of ordinary differential equations.



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COURSE PLAN

Department- Mathematics

Session-2024-25

Class- BCA

Semester-I

Faculty Name- Mrs. Sonia Sharma

Subject- Applied and Discrete Mathematics

Month	Topic	Teaching Tools
August	Set Theory: Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets,	Lecture Method, Venn diagrams, white board etc.
September	Set Theory: Countable and uncountable sets, minset, Partitions of sets, Relations: Basic definitions, graphs of relations, properties of relations Logic and Propositional Calculus: Proposition and Compound Propositions, basic Logical Operations,	Lecture Method, Conceptual understanding, analytical learning
September	Logic and Propositional Calculus: Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Duality law, Algebra of propositions, Conditional and Bi conditional Statements, Arguments, Logical Implication, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements, Inference theory of the predicates calculus.	Truth tables, Learning through Problem solving, learning by doing, Analytical Method

October	Boolean Algebra: Boolean algebra and its duality, Duality, Boolean Algebra as Lattices, Boolean identities, sub-algebra, Representation Theorem, Sum-of-Products Form for Sets, Sum of-Products Form for Boolean Algebra, Minimal Boolean Expressions, Prime Implicants, Boolean Functions, Karnaugh Maps.	Group teaching, and learning through problem-solving. Expeditionary Learning, k-map, Truth tables.
October	Matrices: Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc. Square matrices, Square matrices, inverse and rank of a square matrix, Matrix Inversion method	Lecture method, Drill and Practice

Course Outcomes:

CO.1	At the end of the Semester, Students are able to identify Set, understand the types of a Set, to find the Union, intersection, difference of sets, to apply set theory to solve problems.
CO.2	Students are able to find cross products, to find total number of relations, to find domain and range of a relation , to understand relations of different types, to present the relation in diagrams, matrix form etc.
CO.3	Students are able to understand the concept of countable set and uncountable Sets, to do the partition of a set.
CO.4	Students are able to find whether the statement is a proposition or not, to draw truth tables, to convert a statement in mathematical form and to test it's validity, to express a statement in mathematical form using quantifiers.
CO.5	Students are able to laws of Boolean algebra, to minimize an equation using laws or using k-map.
CO.6	Students are able to add, subtract, multiply two matrices, to express a matrix as a sum of symmetric and skew Symmetric Matrices, to solve linear equations using inversion method



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COURSE PLAN

Department- Mathematics

Session-2024-25

Class- M. Sc. (Comp. Sci.)

Semester-I

Faculty Name- Mrs. Sonia Sharma

Subject- Discrete Structures

Month	Topic	Teaching Tools
August	Sets and Functions: Sets, Relations, Functions, Pigeonhole principle, Inclusion - Exclusion Principle,	Deductive method and learning through problem-solving. Expeditionary Learning
September	Sets and Functions: Equivalence and Partial orderings, Elementary counting techniques, relation of partial order partitions, binary relations Graph Theory: Definition, Walks, Paths, Directed and Undirected graphs, connected graphs, regular and bipartite graphs, Eulerian chains and cycles. Hamiltonian chains and cycles, planar graphs,	Diagrams, ppt and problem solving technique.
September	Graph Theory: Trees and rooted tree, Spanning trees, Chromatic number Connectivity and other graphical parameter application Combinatorial Mathematics: Basic counting principles Permutations and combinations, Recurrence relations, generating Function, Application.	Group teaching, Practice method and Diagrams.
October	Rings: Rings Subrings morphism of rings ideals and quotient rings. Euclidean domains Integral domains	Lecture method, analytical approach and

	and fields	Expeditionary Learning
October	Boolean algebra: Boolean Algebra direct product morphisms Application of Boolean algebra in logic circuits and switching functions.	Participative learning through quiz

Course Outcomes:

CO.1	At the end of the Semester, Students are able to solve problems of set theory theoretically and practically .
CO2.	Students are able to understand a function and difference between relation and function. Students are able to explain all types of function, to check whether the function is a bijection or not.
CO.3	Students are able to find different types of circuits, paths, to find the shortest path and minimum Spanning tree and understand the applications of Graphs.
CO.4	Students are able to find all the possible combination while selecting a particular combination , to calculate total combinations and arrangements in various problems.
CO.5	Students are able to general solution and particular solutions of different recurrence relation equations and to find their generating functions too.
CO.6	Students are able to understand rings, subrings, quotient rings, ideals to differentiate between integral domain and fields.
CO.7	Students are able to apply Boolean algebra to solve real life problems, to apply to solve the problems of computer science.