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 OUTCOME

DEPARTMENT- Mathematics

Name of the class- B.A./ B.Sc. (Non Med)/ B.Sc. (C.Sc.)/ B.Sc.(Eco)/ B.A. B.Ed.

Semester- I

Course/Paper name- Algebra

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.

Course/Paper name- Calculus and Trigonometry

CO.1	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.2	Students are able to analyse continuous and discontinuous function, Apply concept of continuity in uniform continuity.
CO.3	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.4	Students are able to understand the concept of De Moivre's theorem & its applications. Identify circular, hyperbolic function and their inverses.
CO.5	Students are able to demonstrate exponential and logarithmic function of complex

	numbers, and to solve Gregory's series and summation of series.

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Semester- II

Course/Paper name- Calculus and Differential Equations

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	Students are able to understand the concept of linear differential equation with constant and variable coefficients & also the exact differential equations.
CO.4	Students are able to demonstrate the geometrical meaning of a differential equation & the orthogonal trajectories.
CO.5	Students are able to manage to solve the problem related to series solution of differential equations like Bessel and Legendre equation by Power series method.

Course/Paper name- Calculus

CO.1	At the end of the Semester, Students are able to differentiate between limit and continuity of function of two variables and apply this concept in partial derivatives & differentiability of real valued function of two variables.
CO.2	Students are able to manage to solve problems related to Maxima, Minima & Saddle points of functions of two variables.
CO.3	Students are able to classify Envelopes & Evolutes, Application of inverse & implicit function theorems.
CO.4	Students are able to understand the concept of Double and Triple integrals, & application to evaluation of areas, volumes, surfaces of solid of revolution and to apply to find out area and volume of plane and solid figure.

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Semester- III

Course/Paper name- Analysis

CO.1	At the end of the Semester, Students are able to d 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.

Course/Paper name- Analytical Geometry

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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Semester- IV

Course/Paper name- Statics and Vector Calculus

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.

Course/Paper name- Solid Geometry

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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Semester- V

Course/Paper name- Dynamics

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

Course/Paper name- Number Theory

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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Semester- VI

Course/Paper name- Linear Algebra

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.

Course/Paper name- Numerical Analysis

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.

Name of the class- BCA

Semester-I

Course/Paper name- Applied and Discrete Mathematics

CO.1	At the end of the Semester, Students are able to understand Set, various operations of Sets, Types of Sets, application of Set theory to solve problems.
CO.2	Students are able to explain any argument in logical form using logical operators, to check whether it is valid or not
CO.3	Students are able to explain equivalence relation.
CO.4	Students are able to simplify Boolean expressions using various laws, k-map.
CO.5	Students are able to add, subtract, multiply two Matrices, to express a Matrix as sum of symmetric and skew symmetric matrix, Students are able to find the inverse, Rank of a matrix. Students are able to solve linear system of equations using matrix inversion method.

Name of the class- M.Sc. (C.Sc.)

Semester-I

Course/Paper name- Discrete Structure

CO.1	At the end of the Semester Students are able to solve problems using fundamental laws of Set theory. Students are familiar with counting techniques
CO.2	Students are able to check whether the function is one- one, onto, Bijection.
CO.3	Students are able to understand types of graph. Students are able to find the shortest path, minimal spanning tree, Euler circuit, Hamiltonian Circuit.
CO.4	Students are familiar with applications of Boolean algebra.
CO.5	Students are familiar with binary operation, Rings, Subrings, ideals, Integral Domains and Fields.