DEPARTMENT OF MATHEMATICS
LAKHIMPUR GIRLS' COLLEGE

Program Outcomes, Program Specific Outcomes and Course Outcomes

Program Outcome	After successful completion of **three years B.Sc/ B.A. program in Mathematics** a student will have a good understanding of major concepts in all disciplines of Mathematics.
Program Specific Outcome	After successful completion of the program students will be able • To develop patience and perseverance when solving critical problems and logical reasoning. • To improve the mathematical skills in a practical way. • To enhance the critical thinking ability of the students. • To transmit mathematics ideas both orally and in practically. • To inculcate interest among students to participate in seminars, workshops, conferences etc. • To develop their reasoning abilities. • To enable the students to demonstrate the various concepts of Mathematics from both pure and applied branches of Mathematics. • To understand the historical and contemporary role of Mathematics and be able to place the discipline properly in the context of other human intellectual achievement. • To know how and when to use technology in higher Mathematics.
Course Outcome	**Course Outcomes of Choice Based Credit System (CBCS)**

Course	Outcomes
C1.1 Calculus	After going through this course the students will be able to • apply Calculus in real life problems • formulate mathematical models
C1.2 Algebra	After going through this course the students will be able to • describe various algebraic structures on sets • identify the algebraic structures present in different branches of Sciences
C2.1 Real Analysis	After going through this course the students will be able to • identify the properties of the number system. • describe various analytical properties of the real number system.
C2.2 Differential Equations	After going through this course the students will be able to

		• use the techniques to solve differential equations • apply these techniques in various mathematical models used in real life problems
	C3.1 Theory of Real Functions	After going through this course the students will be able to • discuss limit, continuity and differentiability of real valued functions • expand functions in series and different form of remainders
	C3.2 Group Theory I	After going through this course the students will be able to • describe various group structures on sets • identify the group structures present in different branches of sciences
	C3.3 PDE and Systems of ODE	After going through this course the students will be able to • make mathematical formulations and their solutions of various physical problems; design mathematical models used in heat, wave • describe the Laplace equation and their solutions
	C4.1 Numerical Methods	After going through this course the students will be able to • discuss various numerical methods and interpolation formulae • apply numerical techniques for solving differential equation
	C4.2 Riemann Integration and Series of Functions	After going through this course the students will be able to • Riemann integration, improperintegrals • differentiation and integration of powerseries
	C4.3 Ring Theory and Linear Algebra I	After going through this course the students will be able to • describe various ring structures on sets • solve the system of linear equations
	C5.1 Multivariate Calculus	After going through this course the students will be able to • extend the concepts from one variable calculus to function of several variables • demonstrate the ability to think critically and solving application of real world problems involving double/triple integrals
	C5.2 Group Theory II	After going through this course the students will be able to • apply results from preliminary concepts to solve contemporary problems

		• apply in communication theory, electrical engineering, computer science and cryptography
	C6.1 Metric Spaces and Complex Analysis	After going through this course the students will be able to • describe various properties of metrics paces • complex number system, its differentiation and integration
	C6.2 Ring Theory and Linear Algebra II	After going through this course the students will be able to • apply theorems proof/ solution techniques to solve real world problems • find the matrix associated with a linear transformation w.r.t. given bases and can understand the relationship between operations of linear transformations and corresponding matrices
	DSE1.1 Analytical Geometry	After going through this course the students will be able to • sketch parabola, ellipse and hyperbola • solve various geometrical problems analytically
	DSE1.2 Portfolio Optimization	After going through this course the students will be able to define portfolio optimization and apply them to real world problems
	DSE1.3 Financial Mathematics	After going through this course the students will be able to • build quantitative models of financial mathematics/industries • apply models to obtain information of practical value in the financial mathematics
	DSE2.1 Mathematical Modeling	After going through this course the students will be able to solve differential equations and linear programming problems used in mathematical modelling
	DSE2.2 Mechanics	After going through this course the students will be able to • describe Moment of a force and couple, general equation of equilibrium • solve Problems of translation and rotation of rigid bodies
	DSE2.3 Number Theory	After going through this course the students will be able to • obtain solutions of Diophantine equations • define number theoretic functions
	DSE2.4 Bio-Mathematics	After going through this course the students will be able to discuss various models and techniques to study

		Bio-mathematical real life problems.
	DSE2.5 Industrial Mathematics	After going through this course the students will be able to • use various type of numerical methods to model problems and use simulation to solve problem • apply different methods to solve financial problems
	DSE 3.1 Hydro-Mechanics	After going through this course the students will be able to describe the basic properties of Fluid Mechanics
	DSE3.2 Linear Programming	After going through this course the students will be able to • describe various optimization techniques pertaining to linear programming. • apply linear programming to problems arising out of real life problems.
	DSE 3.3 Discrete Mathematics	After going through this course, the students should be able to • explain various discrete structures. • design graph theoretic models of real life problems.
	DSE3.4 Theory of Equations	After going through this course the students will be able to discuss various properties of algebraic equations, symmetric properties of roots and determination of roots.
	DSE 3.5 Dynamical Systems	After going through this course the students will be able to discuss the qualitative properties of difference/differential equations
	DSE 4.1 Mathematical Methods	After going through this course the students will be able to • construct mathematical models or real world problems. • solve real world problems through the studied theories.
	DSE 4.2 Boolean Algebra and Automata Theory	After going through this course the students will be able to • define a lattice • identify various lattice properties and apply them to describe switching circuits.
	42 DSE4.3 Probability and Statistics	After going through this course the students will be able to • characterize the statistical techniques. • define various statistical distributions and obtain their related properties • describe the mathematical theory of probability
	DSE 4.4	After going through this course the students will be

	Differential Geometry	able to • describe various properties of space curves, surfaces and Geodesics • discuss the properties of algebra and calculus of tensors
	SEC-1.1 Logic and Sets	After going through this course the students will be able to • analyze the truth and falsity of a logical statement • differentiate between a logical statement and an ordinary statement • define and describe various properties of sets.
	SEC-1.2 Computer Graphics	After going through this course the students will be able to • indentify the core concepts of computer graphics • apply graphics programming techniques to create and design computer graphics scans
	SEC-2.1 Graph Theory	After going through this course the students will be able to • describe the fundamental properties of Graph Theory • identify different representations of a Graph for practical applications
	SEC-2.2 Operating System: Linux	After going through this course the students will be able to • test the linux process model and explain how linux schedule processes and provide inter-process communication • explore how linux implements files systems and manages input output devices
	GE-1.1 Differential Calculus	After going through this course the students will be able to • differentiate functions • find tangent normal, curvature, asymptotes etc
	GE-1.2 Object Oriented Programming in C++	After going through this course the students will be able to • write C-programmes to solve Mathematical problems • design algorithms to solve problems
	GE-1.3 Finite Element Methods	After going through this course the students will be able to • describe finite element methods • differential equations using finite element methods
	GE-2.1 Differential Equation	After going through this course the students will be able to describe various methods for solving

		differential equations
	GE-2.2 Econometrics	After going through this course the students should be able to design models and solve problems related to Economic issues
	GE-3.1 Real Analysis	After going through this course the students will be able to • analyse the properties of the number line • describe various analytical properties of the real number system
	GE3.2 Cryptography and Network Security	After going through this course the students will be able to • discuss the principles of Cryptography • explain various ways of attacks in complex networks. • explain the structure and organization of the complex network.
	GE 3.3 Information Security	After going through this course the students will be able to describe security issues and data integrity
	GE-4.1 Algebra	After going through this course the students will be able to • describe various algebraic structures onsets • identify the algebraic structures present in different branches of Sciences
	GE-4.2 Applications of Algebra	After going through this course students will be able to • explain various algebraic structure • solve system of linear equations.
	GE4.3 Combinatorial Mathematics	After going through this course students will be able to • use combinatorial approach in solving algebraic problems • explain counting principles.