BSc MATHEMATICS

The curriculum of B.Sc. Mathematics is structured in a way that the students acquire in-depth knowledge to perceive the principles of the core. Basics in Algebra, Calculus , Analytical Geometry , Differential Equations and Transform Techniques are covered exclusively to prepare the students to proceed to the next level of Higher Mathematics of Linear Algebra, Real and Complex Analysis, Mechanics. A list of varied electives namely, Operations Research, Graph Theory, Number Theory, Programming Language 'C', Mathematical Modelling, Programming with Python are furnished to bridge between the Main and Applied Mathematics. The comprehensive curriculum design yields an excellent career opportunity in Research, Education, Public and Private Sectors, Business sectors, Banking, IT Industries and in every domain of contemporaries.

PROGRAM LEARNING OUTCOMES

The comprehensive course outline enables the students to enhance Computational skills and Mathematical reasoning. The program develops the ability to think critically, logically and analytically thereby preparing the students to enhanced career opportunities in Industries, Commerce, Education and Research.

a. NATURE AND EXTENT OF BACHELOR'S DEGREE PROGRAMME

Mathematics is the culmination of in-depth of knowledge of Algebra, Calculus, Differential equations and several other branches of Mathematics. This also leads to selected areas like Computer science and Statistics. Mathematics is a diverse discipline that deals with data, measurement and observations from science, with inference, deduction and proof and with mathematical models of natural phenomena of human behaviour and of social systems.

b. AIMS OF BACHELOR'S DEGREE PROGRAMME IN MATHEMATICS

The overall aim of B.Sc. Mathematics is to
- develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.
- enhance the ability of learners to apply the knowledge and skills acquired by them during the programme to solve specific theoretical and applied problems in mathematics.
- provide students/learners sufficient knowledge and skills enabling them to undertake further studies in mathematics and its allied areas on multiple disciplines concerned with mathematics.

c. GRADUATE ATTRIBUTES IN MATHEMATICS

The graduate attributes in mathematics are mentioned in the expected course learning outcomes of each course which provides critical thinking, analytical reasoning, problem solving and research related skills etc,.

COURSE SPECIFIC OUTCOMES

MAIN/ALLIED /ELECTIVE	SUB NAME	COURSE OUTCOME
MAIN I	ALGEBRA	Basic ideas on Theory of Equations, Matrices and Theory of Numbers. Knowledge to solve theoretical and applied problems.
MAIN II	DIFFERENTIAL CALCULUS	The basics of differentiation and its applications. The notion of curvature, evolutes, involutes and polar co-ordinates.
MAIN III	TRIGONOMETRY	About the expansions of Trigonometric Functions, Hyperbolic Functions and sum of Trigonometric Series.
MAIN IV	INTEGRAL CALCULUS AND VECTOR ANALYSIS	Integration and its geometrical applications, double, triple integrals and improper integrals. Vector differentiation and Vector integration.
MAIN V	ANALYTICAL GEOMETRY	To analyze characteristics and properties of two and three dimensional geometric shapes. To develop mathematical arguments about geometric relationships. In Geometry and its applications in real world.
MAIN VI	DIFFERENTIAL EQUATIONS	About the methods of solving Ordinary and Partial Differential Equations. To introduce Differential Equation as a powerful tool in solving problems in Science.
MAIN VII	TRANSFORM TECHNIQUES	About Laplace Transforms and its inverse To apply Laplace transform in solving Ordinary Differential Equations with constant coefficients, simultaneous Ordinary Differential Equations. To solve problems in Fourier series and Fourier transforms.
MAIN VIII	STATICS	Particles or body in rest under the given forces. Forces, equilibrium of a particle and centre of mass of various bodies.
MAIN IX	ALGEBRAIC STRUCTURES-I	Students will acquire knowledge about the concepts of Sets, Groups and Rings
MAIN X	REAL ANALYSIS-I	Apply Mathematical concepts and Principles to perform numerical and symbolic computations. Understand and perform simple proofs. Know how abstract ideas and rigorous methods in Mathematical Analysis can be applied to practical problems.
MAIN XI	DYNAMICS	The motion of bodies under the influence of forces. Rectilinear motion of particles, Projectiles, Impact and Moment of Inertia of Particles.
MAIN XII	DISCRETE MATHEMATICS	To apply tools and ideas in Mathematics for solving Applied Problems. To Evaluate Boolean functions and to express a logic sentence in terms of predicates, quantifiers, and logical connectives.

MAIN XIII	ALGEBRAIC STRUCTURES-II	Students will acquire knowledge about the Vector Spaces, Dual spaces, Inner product spaces and linear transformations.
MAIN XIV	REAL ANALYSIS-II	The Real Numbers and the Analytic Properties of Real- Valued Functions. The Analytic concepts of Connectedness, Compactness, Completeness And Calculus.
MAIN XV	COMPLEX ANALYSIS	Students will acquire knowledge about the basic ideas of analysis of Complex Functions in solving Complex Variables.
ELECTIVE I	PROGRAMMING IN 'C' WITH PRACTICALS	About the basic concepts and structure of 'C' program. To write simple programs with Mathematical Applications.
ELECTIVE II	GRAPH THEORY	To describe and apply some basic algorithms for graph. To model real world problems using graph theory.
ELECTIVE III	OPERATIONS RESEARCH	Solving Linear Programming Problems. Sequencing the jobs to be carried out based on Cost Optimization. Solving assignment and transportation problems and Queuing Theory Models.
ALLIED I	CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-I	Numerical techniques used as powerful tools in scientific computing. Linear algebraic, transcendental equations and interpolation using finite difference formulae.
ALLIED II	CALCULUS OF FINITE DIFFERENCES AND NUMERICAL ANALYSIS-II	Numerical techniques used as powerful tools in scientific computing. Numerical Differentiation, Numerical Integration and Difference Equations.
ALLIED III	MATHEMATICAL STATISTICS-I	The laws of Probability and Baye's theorem. Measures of Location, Dispersion, Correlation and Regression The Discrete and Continuous Probability Distributions.
ALLIED IV	MATHEMATICAL STATISTICS-II	To provide the foundation of statistical analysis used in varied applications. Of Sampling methods, Tests of significance and testing of hypothesis.