Sri Arvind Mahila College, Patna

Accredited by NAAC with B+ Grade

(A Constituent Unit of Patliputra University, Patna)

4 Years Bachelor of Arts B.A. (Hons.) in Mathematics under CBCS

Course Outcomes

(Major Courses)

S.No.	UG Semester	Course	Course Outcomes
1.	I	MJC-1 Algebra	i) Employ De Moivre's theorem in a number of applications to solve numerical problems. ii) Apply Euclid's algorithm and backwards substitution to find greatest common divisor. iii) Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix, using rank.
2.	II	MJC-2 Calculus & Geometry	CO1: Apply derivatives in Optimization, Social sciences, Physics and Life sciences etc. CO2: Compute area of surfaces of revolution and the volume of solids by integrating over cross- sectional areas.
3.	III	MJC-3 Real Analysis	CO1: Understand many properties of the real line and learn to define sequence in terms of functions. CO2: Recognize bounded, convergent, divergent, Cauchy and monotonic sequences. CO3: Apply tests for convergence and absolute convergence of an infinite series of real numbers.
4.	III	MJC-4 Ordinary Differential Equations	CO1: Understand the concept of ordinary differential equation. CO2: Solve first order linear and non-linear differential equation and linear differential equations of higher order using various techniques. CO3: Apply these techniques to solve and analyze various mathematical models.
5.	IV	MJC-5 Theory of Real Functions	CO1: The concept of limit of a function. CO2: The geometrical properties of continuous functions on closed intervals. CO3: The applications of mean value theorem and Taylor's theorem.
6.	IV	MJC-6 Group Theory	CO1: Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc.

			CO2: Explain the significance of the notion of cosets, normal subgroups, and factor groups. CO3: Understand Automorphism, Class Equation and Sylow's theorem.
7.	IV	MJC-7 Partial Differential Equations	CO1: Formulate, classify and transform partial differential equations into canonical form. CO2: Solve linear and non-linear partial differential equations using various methods. CO3: Solve some physical problems.
8.	V	MJC-8 Ring Theory and Linear Algebra-I	CO1: The fundamental concept of Rings, Fields, subrings, integral domains, ring homomorphisms and their properties. CO2: The concept of linear independence of vectors over a field, the idea of a finite dimensional vector space, basis of a vector space and the dimension of a vector space. CO3: Basic concepts of linear transformations, the Rank-Nullity Theorem, matrix of a linear transformation, algebra of transformations and the change of basis.
9.	V	MJC-9 Multivariate Calculus	CO1: The conceptual variations when advancing in calculus from one variable to multivariable discussions. CO2: Inter-relationship amongst the line integral, double and triple integral formulations. CO3: Applications of multi variable calculus tools in physics, optimization, and understanding the architecture of curves and surfaces in plane and space etc.
10.	VI	MJC-10 Complex Analysis	CO1: Understand the significance of differentiability of complex functions leading to the understanding of Cauchy-Riemann equations. CO2: Evaluate the contour integrals and understand the role of Cauchy-Goursat theorem and the Cauchy integral formula. CO3: Expand some simple functions as their Taylor and Laurent series, get familiar with the linear transformation and Mobius transformation.
11.	VI	MJC-11 Metric Space	CO1: Understand the basic concepts of metric spaces; CO2: Correlate these concepts to their counter parts in real analysis; CO3: Understand the abstractness of the concepts such as open balls, closed balls, compactness, connectedness etc. beyond their geometrical imaginations.

12.	VI	MJC-12 Riemann Integration and Series of Functions	CO1: Some of the families and properties of Riemann integrable functions, and the applications of the fundamental theorems of integration. CO2: Apply Beta and Gamma functions and their properties in finding improper integrals, area under a curve and surface of revolution. CO3: The valid situations for the inter-changeability of differentiability and integrability with infinite sum, and approximation of transcendental functions in terms of power series.
13.	VII	MJC-13 Ring Theory and Linear Algebra-II	COL: Appreciate the significance of factorization in rings and integral domains. CO2: Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces, as well as the geometric and the algebraic multiplicities of eigenvalues. CO3: Compute inner products and determine orthogonality on vector spaces, including Gram-Schmidt orthogonalization to obtain orthonormal basis.
14.	VII	MJC-14 (Research Methodology in Science)	CO1: Develop the skill of contextualization of knowledge and critical thinking CO2: Choose appropriate methods of research aims and objectives CO3: Apply ethical principle in research work. CO4: Understand the philosophy of research integrity and publication ethics.
15.	VII	MJC-15 Numerical Methods	CO1: Various numerical techniques to find the zeroes of nonlinear functions of single variable and solution of a system of linear equations up to a certain given level of precision. CO2: Interpolation techniques to compute the values of functions for equal and unequal intervals. CO3: Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions.
16.	VIII	MJC-16 Mathematical Finance	CO1: Interest rates and its types. CO2: Financial markets and derivatives including options and futures. CO3: Pricing and hedging of options, interest rate swaps and no-Arbitrage pricing concept