

Government General Degree College Chapra
Curriculum Plan under NEP 2020
Department of Mathematics
B.Sc Mathematics (Major Course)
Semester- V

Semester	Period of Semester	Course Code	Name of the Faculty	Paper Name	Brief Description of the Topic	Number of Lecture
SEM- V	July-December	MATH-M-T-06	Dr. Asim Kumar Das	Riemann Integration and Series of Function	<p>Riemann integration: inequalities of upper and lower sums, Darboux theorem, Riemann conditions of integrability, Riemann sum and definition, Riemann integral through Riemann sums.</p> <p>Equivalence of two definitions. Riemann integrability of monotone and continuous functions, properties of the Riemann integral; definition and integrability of piecewise continuous and monotone functions.</p> <p>Fundamental theorem of integral calculus.</p> <p>1st and 2nd mean value theorems for integral calculus.</p> <p>Fourier series: Definition of Fourier coefficients and series, examples of Fourier expansions and summation results for series.</p>	25 L

			Biswajit Paul	Reimann Integration And Series of Function	<p>Improper integration: Type1, Type2. Necessary and sufficient condition for convergence of improper integral in both cases. Cauchy's Criterion. Cauchy's principal value.</p> <p>Tests of convergence: Comparison and μ-test. Absolute and non-absolute convergence and. Abel's and Dirichlet's test for convergence on the integral of a product. Convergence of Beta and Gamma functions. Relation between beta and gamma functions and related problems.</p>	25 L
			Dr. Aninda Chakraborty	Reimann Integration and Series of Function	<p>Pointwise and uniform convergence of sequence of functions. Theorems on continuity, derivability and integrability of the limit function of a sequence of functions.</p> <p>Series of functions. Theorems on the continuity and derivability of the sum function of a series of functions; Cauchy criterion for uniform convergence and Weierstrass M-Test.</p> <p>Power series, radius of convergence, Cauchy Hadamard theorem. Differentiation and integration of power series; Abel's theorem; Weierstrass approximation theorem.</p>	25 L

		MATH-M-T-06	Dr. Asim Kumar Das	Numerical Analysis (Theory & Practical)	<p>Algorithms, convergence, errors, relative, absolute, round-off, truncation errors.</p> <p>Interpolation, Lagrange and Newton's methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation. Central difference interpolation formula: Stirling and Bessel interpolation</p> <p>Numerical differentiation, methods based on interpolations, methods based on finite differences.</p> <p>Numerical integration, Newton Cotes formula, Trapezoidal rule, Simpson's 1/3rd rule, Simpson's 3/8th rule, Weddle's rule, Boole's rule. Midpoint rule, composite trapezoidal rule, composite Simpson's 1/3rd rule, Gauss quadrature formula.</p>	20L
			Dr. Aninda Chakrabarty	Numerical Analysis (Transcendental and polynomial equations, bisection method,	20 L

				<p>Theory & Practical)</p> <p>Newton's method, secant method, Regula-falsi method, fixed point iteration, Newton-Raphson method, rate of convergence of these methods.</p> <p>System of linear algebraic equations, Gaussian elimination and Gauss Jordan methods, Gauss Jacobi method, Gauss Seidel method and their convergence analysis, LU decomposition</p> <p>The algebraic eigenvalue problem, power method.</p> <p>Approximation, least square polynomial approximation.</p>	
			<p>Biswajit Paul</p>	<p>Numerical Analysis (Theory & Practical)</p> <p>Ordinary differential equations: The method of successive approximations, Euler's method, the modified Euler method, Runge-Kutta methods of orders two and four.</p> <p>List of Practical Problems (Using C programming)</p> <p>(i) Bisection Method. (ii) Newton Raphson Method. (iii) Secant Method. (iv) Regula Falsi Method. (v) LU decomposition Method. (vi) Gauss-Jacobi Method.</p>	<p>25 L</p>

					(vi) Gauss-Seidel Method. (vii) Lagrange's Interpolation (viii) Trapezoidal Rule. (ix) Simpson's 1/3rd rule. (x) Euler's method.	
--	--	--	--	--	--	--

Government General Degree College Chapra
Curriculum Plan under NEP 2020
Department of Mathematics
B.Sc Mathematics (Minor Course)
Semester- V

Sem ester	Period of Semester	Course Code	Name of the Faculty	Paper Name	Brief Description of the Topic	Number of Lecture
SEM - V	July-December	MATH-MI – T – 03	Biswajit Paul	Linear Programming Problem	Introduction to linear programming problems, Graphical solution of LPP. Convex sets. Basic solutions and non-basic solutions. Reduction of B.F.S from B.S.	15 L
			Dr. Asim Kumar Das	Linear Programming Problem	Simplex method, Big- <i>M</i> , two-phase method, method and their comparison. Duality, formulation of the dual problem, primal-dual relationships, economic interpretation of the dual.	15 L

			Dr. Aninda Chakrabarty	Linear Programming Problem	<p>Transportation problem and its mathematical formulation, northwest-corner method, least cost method and Vogel approximation method for determination of initial basic solution. Algorithms for solving transportation problems.</p> <p>Assignment problem and its mathematical formulation, Hungarian method for solving assignment problem.</p>	15 L