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

Semester	Period of Semester	Course Code	Name of the Faculty	Paper Name	Brief Description of the Topic	Number of Lecture
SEM- II	January-June	MATH-M-T-02	Biswajit Paul	Algebra - I	Polar representation of complex numbers, nth roots of unity, De Moivre's theorem for rational indices and its applications. Direct and inverse circular form of trigonometric and hyperbolic functions. Exponential & Logarithm of a complex number. Definition of a^z Relation between roots and coefficients, transformation of equation, Descartes rule of signs, solution of cubic equation (Cardan's method), solution of biquadratic equation (Ferrari's method). Well-ordering property of positive integers, division algorithm, divisibility and Euclidean algorithm. Congruence relation between integers. Principles of mathematical induction, statement of fundamental theorem of arithmetic.	30 L

			Dr. Asim Kumar Das	Algebra - I	Equivalence relations and partitions. Functions, composition of functions, Invertible functions, one to one correspondence and cardinality of a set. Permutations, cycle notation for permutations, even and odd permutations. Definition and elementary properties of groups. Symmetries of a square, dihedral groups. quaternion groups (through matrices). Permutation group, alternating group, finite groups: $S3$, $V4$. The group Zn of integers under addition modulo n and the group Un of units under multiplication modulo n. Order of an element, order of a group, simple properties. Subgroups and examples of subgroups. Product of two subgroups. Cyclic group. Properties of cyclic groups. Classification of subgroups of cyclic groups.	25 L
			Dr. Aninda Chakraborty	Algebra - I	Rank of a matrix, inverse of a matrix, characterizations of invertible matrices. Row reduced and echelon forms, Normal form and congruence operations. Solutions of systems of linear equations of the form $Ax=b$ and their applications.	20 L

		. . . MATH-SEC- T-02.	Dr. Aninda Chakrabarty	Fuzzy Set Theory	Fuzzy Sets: Basic concepts, α-cuts and its properties. Representations of fuzzy sets, decomposition theorems. Support, convexity, normality, cardinality of fuzzy sets. Standard set-theoretic operations on fuzzy sets. Zadeh's extension principle.	20 L
		.	Dr. Asim Kumar Das	Fuzzy Set Theory	Interval numbers, arithmetic operations on interval numbers, Fuzzy Numbers. Arithmetic operations on fuzzy numbers (multiplication and division on $\mathbb{R}+$ only). Fuzzy Equations	15 L
			Biswajit Paul	Fuzzy Set Theory	Crisp versus fuzzy Relations. Fuzzy Matrices and Fuzzy Graphs. Composition of fuzzy relations, relational joins. Binary fuzzy relations.	10 L

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

Semester	Period of Semester	Course Code	Name of the Faculty	Paper Name	Brief Description of the Topic	Number of Lecture
SEM - II	January – June	MATH-MI – T – 01	Biswajit Paul	Algebra & Analytical Geometry	Complex Numbers: De Moivre's theorem and itsapplications. Exponential, Sine, Cosine and Logarithm of a complex number. Definition of a^z. Inverse circular and hyperbolic functions. Polynomials: Fundamental theorem of algebra (Statement only). Polynomials with real coefficients, nature of roots of an equation (surd or complex roots occur in pairs). Statement of Descartes's rule of signs and its applications. Relation between roots and coefficients, transformations of equations. Cardan's method of solution of a cubic equation.	15 L
			Dr. Asim Kumar Das	Algebra & Analytical Geometry	Rank of a matrix: Determination of rank either by considering minors or by the sweep-out process. Consistency and solution of a system of linear equations (not more than 3 variables) by matrix method. Equivalence relations and partitions. Functions, composition of functions, invertible functions, one-to-one correspondence and cardinality of a set. Definition and elementary properties of groups. Concepts of permutation Group, alternative group, finite groups: $S3$, $V4$. The group Zn of integers under addition modulo n. Order of an element, order of a group, subgroups and examples of subgroups. Polar equation of straight lines and circles. Polar equation of a conic refers to a focus as a pole.	20 L

					Equation of chord joining two points. Equations of tangents and normals. Sphere and its tangent planes. Right circular cone.	
			Dr. Aninda Chakrabarty	Algebra & Analytical Geometry	Transformations of rectangular axes: Translation, rotation and their combinations. Invariants. General equation of second degree in x and y: Reduction to canonical forms. Classification of conics. Pair of straight lines: Condition that the general equation of 2nd degree in x and y may represent two straight lines. Point of intersection of two intersecting straight lines. Angle between two lines given by ax^2+2hxy+by^2=0. Equation of bisectors. Equation of two lines joining the origin to the points in which a line meets a conic.	15 L

Government General Degree College Chapra
Curriculum Plan under NEP 2020
Department of mathematics in NEP 2020
B.Sc Mathematics (Multidisciplinary Course)
Semester- II

Semester	Period of Semester	Course Code	Name of the Faculty	Paper Name	Brief Description of the Topic	Number of Lecture
SEM - II	January - June	MATH-MD – T - 02	Biswajit Paul	Basic Mathematics	Introduction to sets and their representations. The empty set, finite and infinite sets, equal sets, subsets, power set, and Universal set. Venn Diagrams, operations on sets, complement of a set, problems on union and intersection of sets. Polar representation of complex numbers. De Moivre's theorem (without proof) for rational indices and their applications. Introduction and definition of equation. Types of equations. Relation between roots and coefficients. Descartes's rule of signs. Linear and quadratic equations and their solution. Nature of the roots of quadratic equations.	15 L
			Dr. Asim Kumar Das	Basic mathematics.	Definition of a Matrix. Types of Matrices. Elementary operations on Matrices. Determinant of a square matrix (up to third order). Properties of determinants. Cofactors and minor of a determinant. Transpose and Adjoint of a matrix. Symmetric and Skew Symmetric Matrices. Inverse of a matrix. Solution of system of linear equations (up to third order) using matrix	15 L

					inversion method and Cramer's Rule.	
			Dr. Aninda Chakrabarty	Basic Mathematics	Definition and scope of statistics, concepts of statistical population and sample. Data: qualitative and quantitative, discrete and continuous data types, primary and secondary data. Presentation of data: tabular and graphical. Frequency distribution, cumulative frequency distribution and their graphical representations: histogram, frequency polygon, frequency curve, and O-gives. Measures of Central Tendency: mean, weighted mean, median, mode. Measures of Dispersion: range, mean deviation, standard deviation, coefficient of variation, moments, skewness and kurtosis.	15 L