Maulana Azad College
Department of Mathematics
Teaching / Lesson Plan 2024-25, Undergraduate Mathematics (Honours and General) under CBCS, 2018 & CCF, 2022

Four-Year (Eight-Semester) B. Sc. Degree Course in Mathematics (CCF, 2022) under the University of Calcutta

Semester, [Honours / General], [Period of Semester]	Course Code	Course Name	Brief Description of the Topics	Name of the Faculty	No. of Lectures
[CCF, 2022] **Sem - 1** **Honours** **(July – December, 2024)**	MATH-H-CC1-1-Th	Calculus, Geometry & Vector Analysis	Group-A: Calculus	Dr. Babli Saha	16
			Group-B: Geometry-2D	Dr. Nanda das	10
			Group-B: Geometry-3D	Dr. Somnath Bandyopadhyay	18
			Group-C: Vector Analysis	Dr. Debashis Biswas	16
	MATH-H-SEC1-1-Th	C-Language with Mathematical Applications	1: Computer Architecture of Computer	Dr. Bimal Kumar Sett	6
			2: Constants, Variables & Data Type of C-Program		8
			3:Operation & Expressions		8
			4: Decision Making & Branching		8
			5: Control Statements		8
			6: Arrays		8
			7: User-defined Functions		8
			8: Library Functions		6
[CCF, 2022] **Sem – 1** **Minor** **(July – December, 2024)**	MATH-H-MC1-1-Th	Calculus, Geometry & Vector Analysis	Group-A: Calculus	Dr. Babli Saha	16
			Group-B: Geometry-2D	Dr. Nanda Das	10
			Group-B: Geometry-3D	Dr. Somnath Bandyopadhyay	18
			Group-C: Vector Analysis	Dr. Nanda Das	16
[CCF, 2022] **Sem – 1** **IDC-1** **(July – December, 2024)**	MATH-H-IDC-1-Th	Mathematics in Daily life	Group A: Basic Set Theory	Dr. Babli Saha	4
			Group B: Understanding Integers	Dr. Somnath Bandyopadhyay	8
			Group C: Mathematical Logic	Dr. Babli Saha	6
			Group D: Basic Operation Research	Dr. Nanda Das	8
			Group E: Financial Mathematics	Dr. Nanda Das	9

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Semester, [Honours / General], [Period of Semester]	**Course Code**	**Course Name**	**Brief Description of the Topics**	**Name of the Faculty**	**No. of Lectures**
[CCF, 2022] **Sem - 2** **Honours** **(January – June, 2025)**	MATH-H-CC2-2-Th	Basic Algebra	Group-A: Complex Number, Theory of Equation, Inequalities	Dr. Babli Saha	20
			Group-B: Relation, Mapping, Integers	Dr. Somnath Bandyopadhyay	20
			Group-C: System of Linear Equations	Dr. Somnath Bandyopadhyay	10
			Group-C: Vector Space	Dr. Babli Saha	10
	MATH-H-SEC 2.1-2-Th	Python Programming and Introduction to LaTeX	Group-A: Python Programming	Dr. Abhishek De/ Dr. Bimal Kumar Sett	40
			Group-B: Introduction to LaTeX	Dr. Nanda Das	20
[CCF, 2022] **Sem – 2** **Minor** **(January – June, 2025)**	MATH-H-MC2-2-Th	Basic Algebra	Group-A: Complex Number, Theory of Equation, Inequalities	Dr. Babli Saha	20
			Group-B: Relation, Mapping, Integers	Dr. Somnath Bandyopadhyay	20
			Group-C: System of Linear Equations	Dr. Somnath Bandyopadhyay	10
			Group-C: Vector Space	Dr. Babli Saha	10
[CCF, 2022] **Sem – 2** **IDC-2** **(January – June, 2025)**	MATH-H-IDC-2-Th	Mathematics in Daily life	Group A: Basic Set Theory	Dr. Babli Saha	4
			Group B: Understanding Integers	Dr. Somnath Bandyopadhyay	8
			Group C: Mathematical Logic	Dr. Babli Saha	6
			Group D: Basic Operation Research	Dr. Nanda Das	8
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[CCF, 2022] **Sem - 3 Honours** **(July - December, 2024)**	MATH-H-CC3-3-Th	Real Analysis	Group-A: Real numbers and its properties.	Dr. Somnath Bandyopadhyay	12
			: Point Set theory.		12
			Group-B: Real Sequence & its convergence		14
			: Concept of Sub-sequence and its limit.		14
			Group-C: Infinite Series of Real		8
	MATH-H-CC4-3-Th	Ordinary Differential Equation-I and Group Theory-I	Group-A : Ordinary Differential Equation-I	Dr. Nanda Das	
			: First-order and first-degree ODE		8
			: First-order and higher-degree ODE		8
			: Higher order Linear and Non-linear ODE with constant coefficients.		12
			: Higher order Linear with variable coefficients.		8
			Group-B : Group Theory-I	Dr. Babli Saha	
			: Basic concepts of Group, Sub-group, product of groups.		10
			: Finite group, Order of a group, Cyclic group, Permutation group, Alternating group.		14
	MATH-H-SEC3-3-Th	Linear Programming & Rectangular Games	L.P.P. : Formulation of LPP, Graphical Solution, Basic Feasible Solution	Dr. Debashis Biswas	8
			: Standard form of an LPP, Simplex Method, Two-phase Method.		12
			: Duality Theory, Post optimal Analysis		10
			: Transportation and Assignment Problems.	Dr. Bimal Kumar Sett	12
			Game Theory : Concept of Rectangular Game, Solution by using Pure Strategy.		8
			: Concept of Mixed Strategy, Algebraic Method, Dominance Method, Graphical Method		10
[CCF, 2022] **Sem - 3 Minor** **(July - December, 2024)**	**MATH-H-MC 1-1-Th** Minor-1	Calculus, Geometry & Vector Analysis	Group-A: Calculus	Dr. Babli Saha	16
			Group-B: Geometry-2D	Dr. Nanda Das	10
			Group-B: Geometry-3D	Dr. Somnath Bandyopadhyay	18
			Group-C: Vector Analysis	Dr. Nanda Das	16
[CCF, 2022] **Sem - 3 IDC-3** **(July - December, 2024)**	MATH-H-IDC-3-Th	Mathematics in Daily life	Group A: Basic Set Theory	Dr. Babli Saha	4
			Group B: Understanding Integers	Dr. Somnath Bandyopadhyay	8
			Group C: Mathematical Logic	Dr. Babli Saha	6
			Group D: Basic Operation Research	Dr. Nanda Das	8
			Group E: Financial Mathematics	Dr. Nanda Das	9

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[CCF, 2022] **Sem - 4 Honours** **(January – June, 2025)**	MATH-H-CC5-4-Th	Theory of Real Functions	Group-A: Limit and Continuity of Functions. Limit of functions, Continuity of functions, Bounded functions, Discontinuity of functions, Uniform Continuity of functions. Group-B: Differentiability of Functions Darboux Theorem, Rolle's Theorem, Mean Value Theorem (Lagrange, Cauchy), Taylor's Theorem, Maxima & Minima and their Applications.	Dr. Somnath Bandyopadhyay	36 24
	MATH-H-CC6-4-Th	Mechanics-I	**Statics-I**: Basic principles of statics, Coplanar Forces and its Applications. **Mechanics-I:** Laws of Gravitations, Inertial Frame, Rectilinear Motion, Simple Harmonic Motion, Motion under Elastic String, Motion under Resistance. Work, Power, Energy, Conservative field of Forces, Conservation of Energy. Impulse & Impulsive force, Collision of Elastic bodies, Direct and Oblique impacts. Motion in two-dimensions(Cartesian & Polar), Central Orbit, Planetary motion, Artificial Satellites, Constraint motion under smooth curve.	Dr. Bimal Kumar Sett Dr. Nanda Das	8 18 6 8 20
	MATH-H-CC7-4-Th	Partial Differential Equation-I & Multivariate Calculus-I	**Partial Differential Equation-I:** Formation of PDE, Order & Degree of PDE, Classification of PDE, Heat Equation , Wave Equation, Laplace Equation, KDV Equation. Solution of Linear PDE by Lagrange's Method, Method of Characteristic, Simultaneous PDE, Solution of non-linear equation by Charpit's Method. **Multivariate Calculus-I:** Concept of R^n, Functions in R^n, Limit, Continuity, Differentiability, Directional derivative, Partial derivative of higher order, Euler's theorem, Implicit function , Jacobian, Maxima & Minima, Lagrange's Multiplier Method. Multiple Integral, Iterated or Repeated Integral, Triple Integral, Change of variables in Double and Triple Integral, Determination of Volume, Surface area using multiple integral, Differentiation under sign of integration.	Dr. Debashis Biswas Dr. Bimal Kumar Sett Dr. Nanda Das	10 25 25
	MATH-H-CC8-4-Th	Group Theory-II & Ring Theory-I	**Group Theory-II: Normal Subgroup, Quotient Group, Group of Homomorphism, Automorphism, Automorphism of Groups, External Direct product and its properties, Group of modulo n, Internal direct product, Lagerange's theorem and its converse.** **Ring Theory-I:** Ring, Sub-Ring, Integral domain, Field, Sub-Field, Ideal, Factor Ring, Prime and Maximal Ideal, Ring of homomorphism, Congruance Ring.	Dr. Babli Saha Dr. Babli saha	32 28
[CCF, 2022] **Sem - 4 Minor** **(January – June, 2025)**	**MATH-H-MC 2 -2-Th** Minor-2	Basic Algebra	Group-A: Complex Number, Theory of Equation, Inequalities Group-B: Relation, Mapping, Integers Group-C: System of Linear Equations Group-C: Vector Space	Dr. Babli Saha Dr. Somnath Bandyopadhyay Dr. Somnath Bandyopadhyay Dr. Babli Saha	20 20 10 10

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Three-Year (Six -Semester) B. Sc. Degree Course in Mathematics (CBCS, 2018) under the University of Calcutta

Semester, [Honours / General], [Period of Semester]	Course Code	Course Name	Brief Description of the Topics	Name of the Faculty	No. of Lectures
[CBCS, 2018] **Sem - 5 Honours** **(July – December, 2024)**	CC-11 (TH+TU)	Probability & Statistics	Unit-1: Basic theory, Distribution-I, Expectation-I.	Dr. Nanda Das	20
			Unit-2: Distribution-II, Expectation-II.	Dr. Nanda Das	15+5
			Unit-3: Convergence in Probability.	Dr. Nanda Das	5
			Unit-4: Sampling Distribution, Estimation of Parameters.	Dr. Nanda Das	15
			Unit-5: Statistical Hypothesis.	Dr. Nanda Das	15
	CC-12 (TH+TU)	Group Theory-II & Linear Algebra-II	Unit-1: Group Theory	Dr. Somnath Bandyopadhyay	35
			Unit-2: Linear Algebra	Dr. Babli Saha	40
	DSE-A1 (TH+TU)	Bio Mathematics	Unit-1: Math. Biology and Modelling process.	Dr. Nanda Das	25
			Unit-2: Two-dimensional Model	Dr. Debashis Biswas	30
			Unit-3: Discrete models.	Dr. Nanda Das	15+5
	DSE-B1 (TH+TU)	Linear Programming & Game Theory	Unit-1: Formulation and Basic theory of LPP.	Dr. Debashis Biswas	15
			Unit-2: Simplex method, Two-phase method.	Dr. Debashis Biswas	20
			Unit-3: Duality Theory and Applications.	Dr. Nanda Das	10
			Unit-4: Transportation and Assignment problems and Game Theory.	Dr. Bimal Kumar Sett	30

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Semester, [Honours / General], [Period of Semester]	Course Code	Course Name	Brief Description of the Topics	Name of the Faculty	No. of Lectures
[CBCS, 2018] **Sem -6** **Honours** **(January – June, 2025)**	CC-13 (TH+TU)	Metric Space & Complex Analysis	Unit-1: Metric Space	Dr. Babli Saha	40
			Unit-2: Complex Analysis	Dr. Babli Saha	35
	CC-14 (TH+P)	Numerical Methods	Unit-1: Error & Numerical Algorithms	Dr.Bimal Kumar Sett	5
			Unit-2: Approximation and Interpolation	Dr.Bimal Kumar Sett	15
			Unit-3: Differentiation and Integration.	Dr.Bimal Kumar Sett	10
			Unit-4: Solution of Transcendental Equations.	Dr. Nanda Das	10
			Unit-5: Solution of linear system of equations.	Dr. Nanda Das	10
			Unit-6: Solution of ODE	Dr. Nanda Das	5
		Numerical Methods LAB	Using C Programming (Computer Lab)	Dr. Nanda Das / Dr.Bimal Kumar Sett	20
	DSE-A2 (TH+TU)	Mathematical Modelling	Unit-1: Power Series Solution of Bessel's, Legendre's equations, Laplace Transform.	Dr. Debashis Biswas	20
			Unit-2: Monte Carlo Simulation modelling, Queuing models, Harbor system, Optimization modelling, LP model, Simples Method, Sensitivity analysis.	Dr. Nanda Das	45+10
	DSE-B2 (TH+TU)	Point Set Topology	Unit-1: Topological Space, basis up to isometry and metric invariants.	Dr. Somnath Bandyopadhyay	35
			Unit-2: First Countability, etc. up to Heine's continuity criterion.	Dr. Somnath Bandyopadhyay	15
			Unit-3: Connected Spaces, etc upto Bolzano- Weiertrass property of matric space X.	Dr. Somnath Bandyopadhyay	25

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