<u>**I – Academic Planner**</u>

A.   **Teaching Plan (Year: 2021-22)   Semester: Odd / Even)**

Teacher's Name: Dr. PREETI GARG

Department: MATHEMATICS

Sl No.	UPC	Paper Name	Core/AECC/GE/SEC	Topic/Unit	Start Date	End Date
ODD SEMESTER						
1.	32351502	Group Theory-II	Core B.Sc. (H) Mathematics- V Sem (CBCS_LOCF)	Revision of Groups. Automorphism, inner automorphism, Automorphism groups, Automorphism groups of finite and infinite cyclic groups, Characteristic subgroups, Commutator subgroup and its properties; Applications of factor groups to automorphism groups.	20.07.2021	02.08.2021
				External direct products of groups and its properties, The group of units modulo n as an external direct product, Applications to data security and electric circuits; Internal direct products, Classification of groups of order p^2 where p is a prime; Fundamental theorem of finite abelian groups and its isomorphism classes.	03.08.2021	30.08.2021
				Conjugacy classes, Class equation, p-groups, Conjugacy in S_n.	30.08.2021	06.09.2021
				Group actions. Stabilizers and kernels of group actions; Groups acting on themselves by left multiplication and consequences, permutation representation associated with a given group action, Applications of group actions: Generalized Cayley's theorem, Index theorem.	07.09.2021	27.09.2021
				Finite simple groups, Nonsimplicity tests; Generalized Cayley's theorem, Index theorem, Embedding theorem and applications. Simplicity of An and Revision	28.09.2021	08.10.2021
				Sylow theorems and consequences, Applications of Sylow theorems	18.10.2021	30.10.2020
				Revision and Presentations	01.11.2021	15.11.2021
2.	32351102	BMATH102: Algebra	CORE B.Sc.(H) Mathematics-I Sem	**Unit 1: Theory of Equations** Polynomials, The remainder and factor theorem, Synthetic division, Factored form of a polynomial, Fundamental theorem of algebra, Relations	22.11.2021	05.12.2021

			(CBCS LOCF)	between the roots and the coefficients of polynomial equations, Theorems on imaginary, integral and rational roots(8 Lectures, 4 Tutorials)		
				Unit 1: Complex Numbers Polar representation of complex numbers, De Moivre's theorem for integer and rational indices and their applications. The nth roots of unity.(10 Lectures, 4 Tutorials)	06.12.2021	17.12.2021
				Unit 4: Row Echelon Form of Matrices and Applications. Systems of linear equations, Row reduction and echelon forms, Vector equations, The matrix equation $Ax = b$, Solution sets of linear systems,; Subspaces, Linear independence, Basis and dimension, The rank of a matrix and applications.	20.12.2021	20.01.2022
				Unit 4 Continued: Introduction to linear transformations, The matrix of a linear transformation; Applications to computer graphics, Eigenvalues and eigenvectors, The characteristic equation and Cayley-Hamilton theorem.	21.01.2022	04.02.2022
				Unit 2: Equivalence Relations and Functions Equivalence relations, Functions, Composition of functions, Invertibility and inverse of functions, One-to-one correspondence and the cardinality of a set.	06.02.2022	17.02.2022
				Unit 3: Basic Number Theory. Well ordering principle, The division algorithm in $\mathbb{Z}$, Divisibility and the Euclidean algorithm, Fundamental theorem of arithmetic, Modular arithmetic and basic properties of congruences, Principle of mathematical induction and Revision/doubts	18.02.2022	10.03.2022
3.	32351401	Partial Differential Equations (THEORY)	Core B.Sc. (H) Mathematics IV Sem (CBCS LOCF)	**Unit I:** Introduction, Classification, Construction and geometrical interpretation of first order partial differential equations (PDE), Method of characteristic and general solution of first order PDE, Canonical form of first order PDE, Method of separation of variables for first order PDE.	03.01.2022	31.01.2022
				Unit II: Classification of second order PDE, reduction to canonical forms, equations with constant coefficients, general solution. Gravitational potential, Conservation laws and Burger's equations.	01.02.2022	18.02.2022
				Unit III: Mathematical modeling of vibrating string, vibrating membrane, Cauchy problem for second order PDE, homogeneous wave equation, initial boundary value problems, non-homogeneous boundary conditions, finite strings with fixed ends, non-homogeneous wave equation, Goursat problem	19.02.2022	16.03.2022

				Unit IV: Method of separation of variables for second order PDE, vibrating string problem, existence and uniqueness of solution of vibrating string problem. Heat conduction problem, existence and uniqueness of solution of heat conduction problem, Laplace and beam equation, non-homogeneous problem.	21.03.2022	27.04.2022
4.	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 6: system of ODE: Q1 to 4	12.01.2022	12.01.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 6: Q5 to 8	13.01.2022	13.01.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 2: Plotting of Characteristics curves	19.01.2022	19.01.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 2: Plotting of Characteristics curves continued	20.01.2022	20.01.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 2 finished	27.01.2022	27.01.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 1: Cauchy problem Q1 to Q8	02.02.2022	02.02.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 1: Cauchy problem Q9 to Q16	03.02.2022	03.02.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 3: Integral surface	10.02.2022	10.02.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 4.1: D' Alembert solution of wave eqn	16.02.2021	16.02.2021

	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 4.2 wave equation in finite string	17.02.2022	17.02.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Revision	03.03.2022	03.03.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 5: Heat equation	09.03.2022	10.03.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 7: Pointwise convergence	23.03.2022	24.03.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical 8: Uniform Convergence	30.03.2022	31.03.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Revision and doubts session	06.04.2022	07.04.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Practical file submission	13.04.2022	20.04.2022
	32351401	Partial Differential Equations (Practicals only)	Core B.Sc. (H) Maths IV sem	Internal Assessment exam	21.04.2022	21.04.2022
5.	32351602	Ring Theory and Linear Algebra-II	Core (B.Sc. (H) Mathematics-VI Sem (CBCS)	Review/Revision. Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator.	01.01.2022	31.01.2022
				Inner product spaces and norms, Gram-Schmidt orthogonalization process, orthogonal complements, Bessel's inequality, the adjoint of a linear operator, Least Squares Approximation, minimal solutions to systems of	01.02.2022	12.03.2022

				linear equations. Normal and self-adjoint operators, Unitary and Orthogonal operators and their properties.		
				Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the dual basis, annihilators	21.03.2022	30.03.2022
				Polynomial rings over commutative rings, division algorithm and consequences, principal ideal domains, factorization of polynomials reducibility tests, irreducibility tests, Eisenstein criterion, unique factorization in Z[x]. Divisibility in integral domains, irreducibles, primes, unique factorization domains, Euclidean domains.	31.03.2022	27.04.2022

B. Outstation Field visits for students

Project Name / Paper Name			
Destination		Travel Mode	
Departure Month		Return	
Faculty-in-Charge		Number of Students going	

C. Internal Assessment: House Exam (Test/Presentation etc.) & Assignment*

Course Code	Course Name	Unique Paper Code	Topic Name	Day and Date	Date/s of Exhibiting the Assessment Sheet to students, Discussing the marks, Returning/Retaining
563	B.Sc. (H) Maths I sem	32351102	Linear Algebra	07.03.2022 (Monday)	10.03.2022
563	B.Sc. (H) Maths V sem	32351502	Automorphism, EDP, IDP, FTFAG	25.08.2021 (Wednesday)	31.08.2021
563	B.Sc. (H) Maths IV sem (Theory)	32351401	Different topics for different students by presentations	07.02.2022	24.04.2022
563	B.Sc. (H) Maths Sem – IV	32351401	Internal Assessment Test: Practical 1 to 8	21.04.2022 (Thursday)	21.04.2022

| 563 | B.Sc. (H) Maths VI sem | 32351602 | Inner Product Spaces | 27.04.2022 (Wednesday) | 27.04.2022 |

*Marks of the Internal Assessment to be submitted to the College 15 days before the last working day of563 every semester

D. Organization of Department/College Society Meetings by Staff Advisor/Convener

Department/Society	Meeting Date	Purpose
Audio-Visual Facility and Equipment Maintenance Committee (Convener)	14.09.2021(Tuesday) at 3pm	To review the existing AV facilities in the college
	16.11.2021(Tuesday) at 2pm	To see the demonstration of Interactive touch Flat Panel
	28.2.2022 (Monday) at 2:30pm	Obtained the report on technical status of projectors and TV installed in the college
	28.3.2022 (Monday) at 2pm	To consider the urgent requirement of Projector/TV/IFP in four computer labs as requested by the Department of Computer Science and the Centralized Computer Committee (CCC).
	13.05.2022 (Friday) at 1pm	Discussed the demands received by various departments and submitted the same to college for further action.
	26.07.20229 (Tuesday) at 11.40 am	Annual Report. Arranged demonstration of IFP for user departments and technical staff.

E. College Functions

College Function	Function Date	Role to be played

A. Department activities for students – Election/Freshers/Welcome/Farewell/Department Seminars/Society functions

Event	Date	Timing	Venue	Event In-charge / Supervisor
Department Election	28.01.2022	12.40 p.m.	Google meet	Dr. Raj Kumar and Dr. Kavita Gupta
Fresher's Welcome				
Farewell	05.04.2022	3.00 p.m.	In Parking lawn of KMC	Dr. Raj Kumar and Dr. Kavita Gupta
Department Society functions				
Department Seminars	10.03.2022	10.00 am – 12.00 noon	Seminar room	Dr. Raj Kumar and Dr. Kavita Gupta
Any Other ( )				

B. FDP/Seminar/Workshops/Lectures to be attended and/or to be conducted

Event Topic	**Fractals – Mysterious World in real life**			
Type / Nature (FDP/Webinar/Workshop etc.)	**Qazi Zameeruddin Lecture**			
Organizing In-charge	**Dr. Raj Kumar and DR. Kavita Gupta**			
Details regarding invited Resource Person	Prof. Rashmi Bhardwaj, GGSIPU, School of Basic and Applied Sciences, Fellow of Institute of Mathematics & Applications, UK, Professor of Mathematics, Non-Linear Dynamics Research Lab			
Nature of Participation (e.g. Invited Speaker, Participant etc.)				
Date/s **10.03.2022**	**Timing/s**	**10.00 a.m. – 12.00 noon**	**Mode**	**Physically**