

I – Academic Planner

A. Teaching Plan (Year: 2020-21) 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
1.	32351102	BMATH102: Algebra	CORE B.Sc.(H) Mathematics -I Sem (CBCS LOCF)	Unit 1: Theory of Equations and Complex Numbers Polynomials, The remainder and factor theorem, Synthetic division, Factored form of a polynomial, Fundamental theorem of algebra, Relations between the roots and the coefficients of polynomial equations, Theorems on imaginary, integral and rational roots; Polar representation of complex numbers, De Moivre's theorem for integer and rational indices and their applications. The nth roots of unity.	18.11.2020	18.12.2020
				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.	19.12.2020	14.01.2020
				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.	15.01.2020	03.02.2021
				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, The inverse of a matrix; Subspaces, Linear independence, Basis and dimension, The rank of a matrix and applications.	04.2.2021	18.02.2021

				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.	19.02.2021	05.03.2021
2.	32351502	Group Theory-II	Core B.Sc. (H) Mathematics - V Sem (CBCS)	Automorphism, inner automorphism, automorphism groups, automorphism groups of finite and infinite cyclic groups, applications of factor groups to automorphism groups, Characteristic subgroups, Commutator subgroup and its properties. Properties of external direct products, the group of units modulo n as an external direct product	10.08.2020	01.09.2020
				Internal direct products, Fundamental Theorem of finite abelian groups.	02.09.2020	21.09.2020
				Group actions, stabilizers and kernels, permutation representation associated with a given group action, Applications of group actions: Generalized Cayley's theorem, Index theorem.	22.09.2020	6.10.2020
				Groups acting on themselves by conjugation, class equation and consequences . conjugacy in S_n , Cauchy's theorem, Simplicity of A_n for $n \geq 5$, non-simplicity tests. Dihedral Groups	07.10.2019	02.11.2020
				p -groups, Sylow's theorems and consequences	03.11.2020	27.11.2020
3.	32351401	PARTIAL DIFFERENTIAL EQUATION (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.	02.01.2021	31.01.2021

				<p>Unit II: Classification of second order PDE, reduction to canonical forms, equations with constant coefficients, general solution.</p> <p>Gravitational potential, Conservation laws and Burger's equations.</p>	01.02.2021	18.02.2021
				<p>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</p>	19.02.2021	23.03.2021
				<p>Unit IV: Method of separation of variables for second order PDE, vibrating string problem, existence and uniqueness of solution of vibrating string problem.</p> <p>Heat conduction problem, existence and uniqueness of solution of heat conduction problem, Laplace and beam equation, non-homogeneous problem.</p>	31.03.2021	28.04.2020
4.	32351401	Partial Differential Equations (Practical)	Core B.Sc. (H) Mathematics IV Sem	<p>Practical 2: Characteristic curves</p> <p>Practical 1: Cauchy problem</p> <p>Practical 3: Cauchy problem</p> <p>Practical 6: System of ODE</p>	02.01.2021	02.02.2021
				<p>Practical 4.1: Wave equation in infinite string.</p> <p>Practical 4.2: wave equation in finite string</p> <p>Practical 5: Heat equation</p>	04.02.2021	25.02.2021
				<p>Practical 7: Pointwise convergence</p> <p>Practical 8: Uniform convergence</p>	02.03.2021	23.03.2021
				Viva of group 1 & II	06.04.2021	08.04.2021
				<p>Practical file completion</p> <p>Internal Assessment</p>	13.04.2021	22.04.2021
5.	32351602	Ring Theory and Linear Algebra-II	Core	Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator.	02.01.2021	31.01.2020

			(B.Sc. (H) Mathematics - VI Sem (CBCS)			
				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 linear equations. Normal and self-adjoint operators, Orthogonal projections and Spectral theorem.	01.02.2020	12.03.2020
				Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the dual basis, annihilators	12.03-2020	23.03.2020
				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.	31.03.2020	30.04.2020

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	Unit I	21.12.2020 (Monday)	04.01.2020
563	B.Sc. (H) Maths I sem	32351102	Unit 4 (Linear Algebra)	26.02.2021 (Friday)	02.03.2021
563	B.Sc. (H) Maths V sem	32351502	Automorphism, EDP, Characteristic Subgroup. Commutator Subgroup	01.09.2020 (Tuesday)	10.09.2020
563	B.Sc. (H) Maths V sem	32351502	IDP, FTFAG	21.09.2020 (Monday)	30.09.2020
563	B.Sc. (H) Maths V sem	32351502	Group actions	20.10.2020 (Tuesday)	26.10.2020
563	B.Sc. (H) Maths -IV Sem	32351401	Practical 1 to 9	22.04.2021(Thu)	28.04.2021
563	B.Sc. (H) Maths IV sem (Theory)	32351401	Method of separation of variables	23.03.2021 (Monday)	24.04.2021
563	B.Sc. (H) Maths VI sem	32351602	Inner Product Spaces	12.03.2021(Friday)	21.03.2021
			Rings	16.04.2021(Friday)	24.04.2021

***Marks of the Internal Assessment to be submitted to the College 15 days before the last working day of 563 every semester**

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

Department/Society	Meeting Date	Purpose
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E. College Functions

College Function	Function Date	Role to be played

For Departments

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

Event	Date	Timing	Venue	Event In-charge / Supervisor
Department Election				
Fresher's Welcome				
Farewell				
Department Society functions				
Department Seminars				
Any Other ()				

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

Event Topic	A Pi Story				
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. Vikas Bisht, Associate professor in Department of Mathematics, Panjab University.				
Nature of Participation (e.g. Invited Speaker, Participant etc.)					
Date/s	09.03.2021	Timing/s	12.00 noon – 1.00 p.m.	Mode	Online