

I – Academic Planner

A. Teaching Plan (Year : 2018-19) Semester: Odd / Even)

Teacher's Name : Dr. PREETI GARG Department: MATHEMATICS

| Sl No. | UPC | Paper Name | Core/AE CC/GE/ SEC | Topic/Unit | Start Date | End Date |
|--------|--------------|------------|---|---|------------|------------|
| 1. | 32351 102 | Algebra | CORE B.Sc.(H) Mathemat ics-I Sem | Polar representation of complex numbers, nth roots of unity, De Moivre's theorem for rational indices and its applications. | 20.07.2018 | 10.08.2018 |
| | | | | Equivalence relations, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of a set, 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. | 11.08.2018 | 14.09.2018 |
| | | | | Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation $Ax = b$, solution sets of linear systems, applications of linear systems, Linear independence. | 15.09.2018 | 14.10.2018 |
| | | | | Introduction to linear transformations, matrix of a linear transformation, inverse of a matrix, characterizations of invertible matrices. Subspaces of R^n , dimension of subspaces of R^n and rank of a matrix, Eigen values, Eigen Vectors and Characteristic Equation of a matrix. | 22.10.2018 | 15.11.2018 |

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| 2. | 323515 02 | Group Theory- II | Core B.Sc. (H) Maths (V sem) | 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. | 20.07.2018 | 17.08.2018 |
| | | | | Properties of external direct products, the group of units modulo n as an external direct product, internal direct products, Fundamental Theorem of finite abelian groups. | 18.08.2018 | 14.09.2018 |
| | | | | Group actions, stabilizers and kernels, permutation representation associated with a given group action, Applications of group actions: Generalized Cayley's theorem, Index theorem. Groups acting on themselves by conjugation, class equation and consequences, conjugacy in S_n | 15.09.2018 | 14.10.2018 |
| | | | | p -groups, Sylow's theorems and consequences, Cauchy's theorem, Simplicity of A_n for $n \geq 5$, non-simplicity tests. | 22.10.2018 | 15.11.2018 |
| 3. | 32351 401 | PARTIAL DIFFERENTIAL EQUATION (THEORY) | Core (B.Sc. (H) Maths (IV sem) | 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. Classification of second order PDE, reduction to canonical forms, equations with constant coefficients, general solution. | 01.01.2019 | 31.01.2019 |
| | | | | 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, Riemann problem, Goursat problem, spherical and cylindrical wave equation. | 01.02.2019 | 17.03.2019 |

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|----|----------|-------------------------------------|---------------------------------|---|------------|------------|
| | | | | Method of separation of variables for second order PDE, vibrating string problem, existence and uniqueness of solution of vibrating string problem, | | |
| | | | | Conduction of heat in solids, gravitational potential, conservation laws and Burger's equations, heat conduction problem, existence and uniqueness of solution of heat conduction problem, Laplace and beam equation, non-homogeneous problem. | 25.03.2019 | 28.04.2019 |
| 4. | 32351401 | PARTIAL DIFFERENTIAL EQUATION (LAB) | Core (B.Sc. (H) Maths (IV sem)) | Practical 1,2,3,4.1 | 01.01.2019 | 31.01.2019 |
| | | PARTIAL DIFFERENTIAL EQUATION (LAB) | Core B.Sc. (H) Maths (IV sem) | Practical 4.2, 5,6,7 | 01.02.2019 | 17.03.2019 |
| | | PARTIAL DIFFERENTIAL EQUATION (LAB) | Core B.Sc. (H) Maths (IV sem) | Practical 8,9, Practical file submission and internal assessment | 25.03.2019 | 28.04.2019 |
| 5. | 32351602 | Ring Theory and Linear Algebra-II | Core (B.Sc. (H) Maths (VI sem)) | Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator. | 01.01.2019 | 31.01.2019 |
| | | | | 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. | 01.02.2019 | 1.03.2019 |

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| | | | | Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the dual basis, annihilators Polynomial rings over commutative rings, division algorithm and consequences, principal ideal domains, factorization of polynomials | 1.03-2019 | 17.03.2019 |
| | | | | reducibility tests, irreducibility tests, Eisenstein criterion, unique factorization in $\mathbb{Z}[x]$. Divisibility in integral domains, irreducibles, primes, unique factorization domains, Euclidean domains. | 25.03.2019 | 28.04.2019 |

B. Outstation Field visits for students

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|----------------------------------|--|---------------------------------|--|
| 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 | Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation $Ax = b$, solution sets of linear systems, | 24.10.2018 (Wednesday) | 05.11.2018 |

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|-----|--|----------|--|----------------------|------------|
| | | | applications of linear systems, Linear independence | | |
| 563 | B.Sc. (H) Maths V sem | 32351502 | Group actions, stabilizers and kernels, permutation representation associated with a given group action, Applications of group actions: Generalized Cayley's theorem, Index theorem. Groups acting on themselves by conjugation, class equation and consequences, conjugacy in S_n | 23.10.2018 (Tuesday) | 05.11.2018 |
| 563 | B.Sc. (H) Maths IV sem (Practical) | 32351401 | Practicals 1 to 9 of partial differential equations | 24.04.2019(Wed) | 24.04.2019 |
| 563 | B.Sc. (H) Maths IV sem (Theory) | 32351401 | The Cauchy Problem and Wave Equation (Chapter 5) | 28.03.2019(Thursday) | 8.04.2019 |
| 563 | B.Sc. (H) Maths VI sem | 32351602 | Inner Product Spaces | 28.03.19(Thursday) | 11.04.2019 |

***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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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

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|--|----------|--|------|--|--|
| Event Topic | | | | | |
| Type / Nature (FDP/Webinar/Workshop etc.) | | | | | |
| Organizing In-charge | | | | | |
| Details regarding invited Resource Person | | | | | |
| Nature of Participation (e.g. Invited Speaker, Participant etc.) | | | | | |
| Date/s | Timing/s | | Mode | | |