**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: M.A. and M.Sc. – 1st Sem.**

**Subject/Paper: Abstract Algebra**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **01-08-2024 to 03-08-2024** | **Normal subgroup, quotient group, normalizer and centralizer of a non-empty subset of a group G,** |  |
|  | **05-08-2024 to 10-08-2024** | **commutator subgroups of a group.** |  |
|  | **12-08-2024 to 17-08-2024** | **first, second and third isomorphism theorems, correspondence theorem, Aut(G), Inn(G), automorphism group of a cyclic group, G-sets, orbit of an element in group G,** |  |
|  | **20-08-2024 to 24-08-2024** | **Cayley‟s theorem. conjugate elements and conjugacy classes, class equation of a finite group G and its applications,** |  |
|  | **27-08-2024 to 31-08-2024** | **Burnside theorem. normal series, composition series, Jordan Holder theorem, Zassenhaus lemma, Scheier‟s refinement theorem, solvable group, nilpotent group.** |  |
|  | **02-09-2024 to 07-09-2024** | **continue** |  |
|  | **09-09-2024 to 14-09-2024** | **continue** |  |

**\*Vacation as per university calendar**

**\*Assignments and unit test will be taken as per schedule.**

**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: M.A. and M.Sc. – 1st Sem.**

**Subject/Paper: Abstract Algebra**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **16-09-2024 to 21-09-2024** | **Cyclic decomposition, even and odd permutation, Alternation group An, simplicity of the Alternating group An (n>5).** |  |
|  | **24-09-2024 to 28-09-2024** | **Cauchy‟s theorem, Sylow‟s first, second and third theorems and its applications to group of smaller orders. groups of order p2 and pq (q>p).** |  |
|  | **30-09-2024 to 5-10-2024** | **continue** |  |
|  | **07-10-2024 to 12-10-2024** | **continue** |  |
|  | **14-10-2024 to 19-10-2024** | **Modules, submodules, direct sums, finitely generated modules, cyclic module.** |  |
|  | **21-10-2024 to 26-10-2024** | **R-homomorphism, quotient module, completely reducible modules,** |  |
|  | **04-11-2024 to 09-11-2024** | **Schur‟s lemma, free modules, representation of linear mapping, rank of linear mapping.** |  |

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: M.A. and M.Sc. – 1st Sem.**

**Subject/Paper: Abstract Algebra**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **11-11-2024 to 16-11-2024** | **Similar linear transformation, invariant subspaces of vector spaces, reduction of a linear transformation to triangular form, nilpotent transformation, index of nilpotency of a nilpotent transformation.** |  |
|  | **18-11-2024 to 23-11-2024** | **Cyclic subspace with respect to a nilpotent transformations, uniqueness of the invariants of a nilpotent transformation.** |  |
|  | **25-11-2024 to 30-11-2024** | **Primary decomposition theorem. Jordan blocks, Jordan canonical forms, cyclic module relative to a linear transformation, rational canonical form of a linear transformation and its elementary divisors, uniqueness of elementary divisors.** |  |
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**\*Vacation as per university calendar**

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 5th Sem.**

**Subject/Paper: Numerical Analysis**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **22-07-2024 to 27-07-2024** | **Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values** |  |
|  | **29-07-2024 to 03-08-2024** | **Interpolation with equal intervals: Newton’s forward and Newton’s backward interpolation formulae.** |  |
|  | **05-08-2024 to 10-08-2024** | **Interpolation with unequal intervals: Newton’s divided difference, Lagrange’s Interpolation formulae, Hermite Formula.** |  |
|  | **12-08-2024 to 17-08-2024** | **Central Differences: Gauss forward and Gauss’s backward interpolation formulae** |  |
|  | **20-08-2024 to 24-08-2024** | **Sterling, Bessel Formula. Probability distribution of random variables,** |  |
|  | **27-08-2024 to 31-08-2024** | **Binomial distribution, Poisson’s distribution, Normal distribution: Mean, Variance and Fitting.** |  |
|  | **02-09-2024 to 07-09-2024** | **Numerical Differentiation: Derivative of a function using interpolation formulae** |  |

**\*Vacation as per university calendar**

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 5th Sem.**

**Subject/Paper: Numerical Analysis**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **09-09-2024 to 14-09-2024** | **Eigen Value Problems: Power method, Jacobi’s method** |  |
|  | **16-09-2024 to 21-09-2024** | **Given’s method, HouseHolder’s method, QR method, Lanczos method.** |  |
|  | **24-09-2024 to 28-09-2024** | **Numerical Integration: Newton-Cote’s Quadrature formula** |  |
|  | **30-09-2024 to 5-10-2024** | **Trapezoidal rule, Simpson’s one- third and three-eighth rule** |  |
|  | **07-10-2024 to 12-10-2024** | **Chebychev formula, Gauss Quadrature formula** |  |
|  | **14-10-2024 to 19-10-2024** | **Numerical solution of ordinary differential equations: Single step methods Picard’s method.** |  |
|  | **21-10-2024 to 26-10-2024** | **Taylor’s series method, Euler’s method, Runge-Kutta Methods** |  |

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 5th Sem.**

**Subject/Paper: Numerical Analysis**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **04-11-2024 to 09-11-2024** | **Multiple step methods; Predictor-corrector method, Modified Euler’s method, Milne-Simpson’s method** |  |
|  | **11-11-2024 to 16-11-2024** | **Revision** |  |
|  | **18-11-2024 to 22-11-2024** | **Revision** |  |
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**\*Vacation as per university calendar**

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 3rd Sem.**

**Subject/Paper: Differential Equations-I**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **22-07-2024 to 27-07-2024** | **Basic concepts and genesis of ordinary differential equations, Order and degree of a differential equation, Solutions of differential equations of first order and first degree,** |  |
|  | **29-07-2024 to 03-08-2024** | **continue** |  |
|  | **05-08-2024 to 10-08-2024** | **continue** |  |
|  | **12-08-2024 to 17-08-2024** | **Exact differential equations, Integrating factor, First order higher degree equations solvable for x, y and p, Lagrange’s equations, Clairaut’s form** |  |
|  | **20-08-2024 to 24-08-2024** | **singular solutions. Orthogonal trajectories of one-parameter families of curves in a plane.** |  |
|  | **27-08-2024 to 31-08-2024** | **Solutions of linear ordinary differential equations with constant coefficients, linear non-homogeneous differential equations.** |  |
|  | **02-09-2024 to 07-09-2024** | **Linear differential equation of second order with variable coefficients** |  |

**\*Vacation as per university calendar**

**\*Assignments and unit test will be taken as per schedule.**

**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 3rd Sem.**

**Subject/Paper: Differential Equations-I**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **09-09-2024 to 14-09-2024** | **. Method of reduction of order, method of undetermined coefficients, method of variation of parameters. Cauchy-Euler equation.** |  |
|  | **16-09-2024 to 21-09-2024** | **Solution of simultaneous differential equations, total differential equations.** |  |
|  | **24-09-2024 to 28-09-2024** | **Genesis of Partial differential equations (PDE), Concept of linear and nonlinear PDEs. Complete solution, general solution and singular solution of a PDE. Linear PDE of first order.** |  |
|  | **30-09-2024 to 5-10-2024** | **Lagrange’s method for PDEs of the form: P(x ,y, z) p + Q(x, y, z) q = R(x, y, z), where p=∂z/∂x and q=∂z/∂y.** |  |
|  | **07-10-2024 to 12-10-2024** | **Integral surfaces passing through a given curve. Surfaces orthogonal to a given system of surfaces.** |  |
|  | **14-10-2024 to 19-10-2024** | **Compatible systems of first order equations. Charpit’s method,** |  |
|  | **21-10-2024 to 26-10-2024** | **Special types of first order PDEs, Jacobi’s method.** |  |

**\*Vacation as per university calendar**

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 3rd Sem.**

**Subject/Paper: Differential Equations-I**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **04-11-2024 to 09-11-2024** | **Second Order Partial Differential Equations with Constant Coefficients.** |  |
|  | **11-11-2024 to 16-11-2024** | **continue** |  |
|  | **18-11-2024 to 22-11-2024** | **revision** |  |
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**\*Vacation as per university calendar**

**\*Assignments and unit test will be taken as per schedule.**

**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 1st Sem.**

**Subject/Paper: Calculus**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **22-07-2024 to 27-07-2024** | **Successive differentiation, Leibnitz theorem** |  |
|  | **29-07-2024 to 03-08-2024** | **Continue** |  |
|  | **05-08-2024 to 10-08-2024** | **Taylor’s and Maclaurin’s series expansion with different forms of remainder.** |  |
|  | **12-08-2024 to 17-08-2024** | **Continue** |  |
|  | **20-08-2024 to 24-08-2024** | **Continue** |  |
|  | **27-08-2024 to 31-08-2024** | **continue** |  |
|  | **02-09-2024 to 07-09-2024** | **Application of L’Hospital rule to indeterminate** |  |

**\*Vacation as per university calendar**

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 1st Sem.**

**Subject/Paper: Calculus**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **09-09-2024 to 14-09-2024** | **ɛ-δ definition of limit and continuity of a real valued function, Basic properties of limits, Types of discontinuities, Differentiability of functions** |  |
|  | **16-09-2024 to 21-09-2024** | **Asymptotes: Horizontal, vertical and oblique asymptotes for algebraic curves, Asymptotes for polar curvesIntersection of a curve and its asymptotes,** |  |
|  | **24-09-2024 to 28-09-2024** | **Continue** |  |
|  | **30-09-2024 to 5-10-2024** | **Curvature and radius of curvature of curves (cartesian, parametric, polar & intrinsic forms), Newton’s method, Centre of curvature and circle of curvature.** |  |
|  | **07-10-2024 to 12-10-2024** | **Continue** |  |
|  | **14-10-2024 to 19-10-2024** | **Continue** |  |
|  | **21-10-2024 to 26-10-2024** | **Reduction formulae.** |  |

**\*Vacation as per university calendar**

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 1st Sem.**

**Subject/Paper: Calculus**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **04-11-2024 to 09-11-2024** | **Multiple points, Node, Cusp, Conjugate point, Tests for concavity and convexity, Points of inflexion, Tracing of curves** |  |
|  | **11-11-2024 to 16-11-2024** | **Rectification, intrinsic equation of a curve, Quadrature, Area bounded by closed curves, Volumes and surfaces of solids of revolution** |  |
|  | **18-11-2024 to 22-11-2024** | **Continue** |  |
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**\*Vacation as per university calendar**

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**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 1st Sem.**

**Subject/Paper: Practical Calculus**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **26-07-2024 to 27-07-2024** | **Make the students learn the downloading and installation of the software Maxima and Practical on topics covered** |  |
|  | **02-08-2024 to 03-08-2024** | **Practical and problem solving on topics covered** |  |
|  | **09-08-2024 to 10-08-2024** | **Practical and problem solving on topics covered** |  |
|  | **16-08-2024 to 17-08-2024** | **Practical and problem solving on topics covered** |  |
|  | **23-08-2024 to 24-08-2024** | **Practical and problem solving on topics covered** |  |
|  | **30-08-2024 to 31-08-2024** | **Practical and problem solving on topics covered** |  |
|  | **06-09-2024 to 07-09-2024** | **Practical and problem solving on topics covered** |  |

**\*Vacation as per university calendar**

**\*Assignments and unit test will be taken as per schedule.**

**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 1st Sem.**

**Subject/Paper: Practical Calculus**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **13-09-2024 to 14-09-2024** | **Practical and problem solving on topics covered** |  |
|  | **20-09-2024 to 21-09-2024** | **Practical and problem solving on topics covered** |  |
|  | **27-09-2024 to 28-09-2024** | **Practical and problem solving on topics covered** |  |
|  | **04-10-2024 to 05-10-2024** | **Practical and problem solving on topics covered** |  |
|  | **11-10-2024 to 12-10-2024** | **Practical and problem solving on topics covered** |  |
|  | **18-10-2024 to 19-10-2024** | **Practical and problem solving on topics covered** |  |
|  | **25-10-2024 to 26-10-2024** | **Practical and problem solving on topics covered** |  |

**\*Vacation as per university calendar**

**\*Assignments and unit test will be taken as per schedule.**

**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Mathematics**

**Class: B.A. and B.Sc. – 1st Sem.**

**Subject/Paper: Practical Calculus**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **08-11-2024 to 09-11-2024** | **Practical and problem solving on topics covered** |  |
|  | **15-11-2024 to 16-11-2024** | **Practical and problem solving on topics covered** |  |
|  | **122-11-2024** | **Practical and problem solving on topics covered** |  |
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**\*Vacation as per university calendar**

**\*Assignments and unit test will be taken as per schedule.**

**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Commerce**

**Class: B.Com. – 1st Sem.**

**Subject/Paper: Business Mathematics-I**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **05-08-2024 to 06-08-2024** | **Matrices and Determinants: Definition of a matrix, order, equality, types of matrices;** |  |
|  | **12-08-2024 to 13-08-2024** | **Operations on matrices: Addition, multiplication and multiplication with a scalar and their simple properties.** |  |
|  | **20-08-2024** | **Determinant of a square matrix (upto 3x 3 order): Properties of determinants,** |  |
|  | **27-08-2024** | **minors, co-factors and applications of determinants in finding the area of triangle, adjoint and inverse of a square matrix, solutions of a system of linear equations by examples.** |  |
|  | **02-09-2024 to 03-09-2024** | **Compound interest and annuities: Different types of interest rates, types of annuities** |  |
|  | **09-09-2024 to 10-09-2024** | **Present value and amount of an annuity (including the case of continuous compounding), valuation of simple loans and debentures, problems related to sinking funds.** |  |
|  | **16-09-2024 to 17-09-2024** | **continue** |  |

**\*Vacation as per university calendar**

**\*Assignments and unit test will be taken as per schedule.**

**LESSON-PLAN (Session 2024-25) Odd Semester**

**Name of Professor: Satbir Singh**

**Subject: Commerce**

**Class: B.Com. – 1st Sem.**

**Subject/Paper: Business Mathematics-I**

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| **Sr. No.** | **Days** | **Topics to be covered** | **Remarks if any** |
|  | **24-09-2024** | **Arithmetic and geometric progression** |  |
|  | **30-09-2024 to 1-10-2024** | **continue** |  |
|  | **7-10-2024 to**  **8-10-2024** | **continue** |  |
|  | **14-10-2024 to 15-10-2024** | **Logarithms: Laws of operation, log tables** |  |
|  | **21-10-2024 to 22-10-2024** | **Set Theory: Representation of sets, equivalent sets, power set, complement of a set. Venn Diagrams:** |  |
|  | **04-11-2024 to 05-11-2024** | **Union and intersection of sets, De-Morgan's laws; Logical statements and truth tables.** |  |
|  | **11-11-2024 to 12-11-2024** | **Revision** |  |
|  | **18-11-2024 to 19-11-2024** | **Revision** |  |

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