Session 2023-24

Lesson Plan

Name of the Assistant Professor: Mrs. Manju Rani
Name of the Department: Mathematics
Class and Section: B.A./B.Sc 2nd Sem.
Subject: Number Theory and Trigonometry (MAT 102A)

Month	Topic
January 2024	De Moivre's Theorem and its Applications. Expansion of trigonometrical functions.
February 2024	Direct circular and hyperbolic functions and their properties.
March 2024	Inverse circular and hyperbolic functions and their properties. Logarithm of a complex quantity.
April 2024	Gregory's series. Summation of Trigonometry series. Revision and Test

Signature

Mrs Manju Rani
Assistant professor
Mathematics
GCW, Sonipat

Session 2023-24

Lesson Plan

Name of the Assistant Professor: Mrs. Manju Rani
Name of the Department: Mathematics
Class and Section: B.A./B.Sc. 2nd Sem.
Subject: Vector Calculus (MAT 102C)

Month	Topic
January 2024	Scalar and vector product of three vectors, product of four vectors. Reciprocal vectors. Vector differentiation. Scalar Valued point functions, vector valued point functions, derivative along a curve, directional derivatives
February 2024	Gradient of a scalar point function, geometrical interpretation of grad Φ , character of gradient as a point function. Divergence and curl of vector point function, characters of Div f$\rho$and Curl fρ as point function, examples. Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator.
March 2024	Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors. Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates, Cylindrical co-ordinates and Spherical co-ordinates. Class Test
April 2024	Vector integration; Line integral, Surface integral, Volume integral. Theorems of Gauss, Green & Stokes and problems based on these theorms. Assignment , Revision, Test

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Lesson Plan

Name of the Assistant Professor: Mrs. Manju Rani
Name of the Department: Mathematics
Class and Section: B.A. / B.Sc. 4th Sem.
Subject: Sequences and Series (MAT 202A)

Month	Topic
January 2024	Boundedness of the set of real numbers; least upper bound, greatest lower bound of a set, neighborhoods, interior points, isolated points, limit points, open sets, closed set, interior of a set, closure of a set in real numbers and their properties. Bolzano-Weierstrass theorem, Open covers, Compact sets and Heine-Borel Theorem.
February 2024	Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Subsequential limits. Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series, Cauchy's general principle of Convergence of series, Convergence and divergence of geometric series, Hyper Harmonic series or p-series.
March 2024	Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test, Cauchy's Nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test.
April 2024	Alternating series, Leibnitz's test, absolute and conditional convergence, Arbitrary series: abel's lemma, Abel's test, Dirichlet's test, Insertion and removal of parenthesis, re-arrangement of terms in a series, Dirichlet's theorem, Riemann's Re-arrangement theorem. Pringsheim's theorem (statement only), Multiplication of series, Cauchy product of series (definitions and examples only). Convergence and absolute convergence of infinite products (definitions and examples only). Revision, Test

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Session 2023-24

Lesson Plan

Name of the Assistant Professor: Mrs. Manju Rani
Name of the Department: Mathematics
Class and Section: B.A. 4th Sem.
Subject: Numerical Analysis (MAT 202 C)

Month	Topic
January 2024	Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae.
February 2024	Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae, Hermite's Formula.
March 2024	Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula.
April 2024	Probability distribution of random variables, Binomial distribution, Poisson's distribution, Normal distribution: Mean, Variance and Fitting. Assignment, Revision, Test

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Session 2023-24

Lesson Plan

Name of the Assistant Professor: Mrs. Manju Rani
Name of the Department: Mathematics
Class and Section: B.A. 4th Sem.
Subject: Numerical Analysis (MAT 202 C)

Month	Topic
January 2024	Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values, Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae.
February 2024	Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae, Hermite's Formula.
March 2024	Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula.
April 2024	Probability distribution of random variables, Binomial distribution, Poisson's distribution, Normal distribution: Mean, Variance and Fitting. Assignment, Revision, Test

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Session 2023-24

Lesson Plan

Name of the Assistant Professor: Mrs. Manju Rani
Name of the Department: Mathematics
Class and Section: B.A. 6th Sem.
Subject: Linear Algebra (MAT 302 B)

Month	Topic
January 2024	Vector spaces, subspaces, Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space. Finitely generated vector space, Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces, Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension.
February 2024	Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces, Vector space of all the linear transformations Dual Spaces, Bidual spaces, annihilator of subspaces of finite dimensional vector spaces, Null Space, Range space of a linear transformation, Rank and Nullity Theorem.
March 2024	Algebra of Linear Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations, Matrix of a linear Transformation, Change of basis, Eigen values and Eigen vectors of linear transformations.
April 2024	Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors, Orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces, Gram-Schmidt Orthogonalization process, Adjoint of a linear transformation and its properties, Unitary linear transformations. Assignment, Revision, Test

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Session 2023-24

Lesson Plan

Name of the Assistant Professor: Mrs. Manju Rani
Name of the Department: Mathematics
Class and Section: B.A. 6th Sem.
Subject: Dynamics (MAT 302 C)

Month	Topic
January 2024	Velocity and acceleration along radial, transverse, tangential and normal directions. Relative velocity and acceleration. Simple harmonic motion. Elastic strings.
February 2024	Mass, Momentum and Force. Newton's laws of motion. Work, Power and Energy. Definitions of Conservative forces and Impulsive forces.
March 2024	Motion on smooth and rough plane curves. Projectile motion of a particle in a plane. Vector angular velocity.
April 2024	General motion of a rigid body. Central Orbits, Kepler laws of motion. Motion of a particle in three dimensions. Acceleration in terms of different co-ordinate systems. Assignment, Revision, Test

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