

	DYALSINGH COLLEGE, KARNAL
	Lesson Plan for Odd Semesters
	Algebra (BM-111)
	B.A/B.Sc.Sem1
	Department of Mathematics
2022-2023	
September 1-3, 2022	Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices. Elementary Operations on matrices.
September 5- 10, 2022	Rank of a matrix. Inverse of a matrix
September 12- 18, 2022	Ch. Equation of Matrix,
September 19- 24, 2022	Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix
Sep. 27-Oct. 1, 2022	Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix
Oct. 3 – 8, 2022	Cayley Hamilton theorem and its use in finding the inverse of a matrix.
Oct. 10 – 15, 2022	Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations. Theorem on consistency of a system of linear equations.
Oct. 17 – 21, 2022	Unitary and Orthogonal Matrices, Bilinear and Quadratic forms.
Oct. 27 – 29, 2022	Transformation of equation
Oct. 30 – 31; Nov. 2-5, 2022	Relations between the roots and coefficients of general polynomial equation in one variable, Solutions of polynomial equations having conditions on roots
Nov. 7-12, 2022	Common roots and multiple roots. Transformation of equations
Nov. 14-19, 2022	Nature of the roots of an equation, Descartes' rule of signs.
Nov. 21-26, 2022	Solutions of cubic equations (Cardan's method)
Nov. 28-30; Dec. 1-3, 2022	Biquadratic equations and their solutions.
Dec. 5- 10, 2022	Problems discussed relevant to syllabus
Dec. 12- 17, 2022	Revision of syllabus, Unit Test
Dec. 19- 27, 2022	Revision
	B.A/B.Sc.–1st Year (Semester– I) BM–112: Calculus

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2022-2023	
September 1-3, 2022	Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities.
September 5- 10, 2022	Differentiability, Successive differentiation, Leibnitz theorem
September 12- 18, 2022	Maclaurin and Taylor series expansions.
September 19- 24, 2022	Asymptotes in Cartesian coordinates, intersection of curve and its asymptotes
Sep. 27-Oct.1, 2022	Asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves,
Oct.3 – 8, 2022	Newton's method. Radius of curvature for pedal curves. Tangential polar equations.
Oct.10 – 15, 2022	Centre of curvature. Circle of curvature, Chord of curvature, evolutes
Oct.17 – 21, 2022	Tests for concavity and convexity. Points of inflexion. Multiple points.
Oct.27 – 29, 2022	Cusps, nodes & conjugate points. Type of cusps.
Oct.30 – 31; Nov. 2-5, 2022	Tracing of curves in Cartesian, parametric and polar coordinates.
Nov. 7-12, 2022	Reduction formulae, Rectification
Nov. 14-19, 2022	Rectification (continued), intrinsic equation of curve,
Nov. 21-26, 2022	Quadrature (area) Sectorial area, Area bounded by closed curves
Nov. 28-30; Dec.1-3, 2022	Volumes and surfaces of solids of revolution. Theorems of Pappus and Guldens.
Dec. 5- 10, 2022	Revision and unit test
Dec. 12- 17, 2022	Revision
Dec. 19- 27, 2022	Revision
	B.A./B.Sc.–Ist Year (Semester–I) BM–113: Solid Geometry
2022-2023	
September 1-3, 2022	General equation of second degree.
September 5- 10, 2022	Tracing of conics
September 12- 18, 2022	Tangent at any point to the conic, chord of contact,
September 19- 24, 2022	Pole of line to the conic, director circle of conic. System of conics.

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Sep. 27-Oct. 1, 2022	Confocal conics. Polar equation of a conic, tangent and normal to the conic.
Oct. 3 – 8, 2022	Sphere: Plane section of a sphere.
Oct. 17 – 21, 2022	Co-axial system of spheres
Oct. 27 – 29, 2022	Cones, Right circular cone,
Oct. 30 – 31; Nov. 2-5, 2022	Enveloping cone and reciprocal cone.
Nov. 7-12, 2022	Cylinder: Right circular cylinder and enveloping cylinder
Nov. 14-19, 2022	Central Conicoids: Equation of tangent plane
Nov. 21-26, 2022	Director sphere, Normal to the conicoids.
Nov. 28-30; Dec. 1-3, 2022	Polar plane of a point, Enveloping cone of a conicoid
Dec. 5- 10, 2022	Enveloping cylinder of a conicoid.
Dec. 12- 17, 2022	Generating lines, Confocal conicoid. Reduction of second degree equations. Revision and unit test
Dec. 19- 27, 2022	Revision

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B.A/B.Sc-IIIndYear(Semester-III)	
BM-231AdvancedCalculus	
2022-2023	
September 1-3, 2022	Continuity, Sequential Continuity, properties of continuous functions, Uniform Continuity
September 5- 10, 2022	Chain rule of differentiability. Mean value theorems
September 12- 18, 2022	Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations.
September 19- 24, 2022	Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives
Sep. 27-Oct.1, 2022	Indeterminate forms.
Oct.3 – 8, 2022	Limit and continuity of real valued functions of two variables. Partial differentiation, Total Differentials, Composite functions & implicit functions
Oct.10 – 15, 2022	Change of variables, Homogeneous functions & Euler's theorem on homogeneous functions.
Oct.17 – 21, 2022	Differentiability of real valued functions of two variables. Schwarz and Young's Theorem
Oct.27 – 29, 2022	Implicit function theorem. Maxima, Minima and saddle points of two Variables
Oct.30 – 31; Nov. 2-5, 2022	Lagrange's method of multipliers.

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Nov. 7-12, 2022	Curves:Tangents,Principal normals,Binormals,Serret-Frenet formulae.
Nov. 14-19, 2022	Spherical curvature,Locus of centre of Spherical curvature,
Nov. 21-26, 2022	Involutes,evolutes,Bertrand Curves.Surfaces:Tangent planes,one parameter family of surfaces,Envelopes.
Nov. 28-30; Dec.1-3, 2022	Revision and unit test
Dec. 5- 10, 2022	Revision
Dec. 12- 17, 2022	Revision
Dec. 19- 27, 2022	Revision
	B.A./B.Sc.- 2nd Year (Semester3)BM- 232:Partial Differential Equation
2022-2023	
September 1-3, 2022	Formation, order and degree of Partial Differential Equation
September 5- 10, 2022	Linear and Non-Linear Partial Differential Equation
September 12- 18, 2022	Complete solution, singular solution
September 19- 24, 2022	General solution, Solution of Lagrange's linearequations,
Sep. 27-Oct.1, 2022	Charpit's general method of solution, Compatible system of first order equations, Jacobi's method.
Oct.3 – 8, 2022	Linear partial differential equations of second and higher orders
Oct.10 – 15, 2022	Linear and non-linear homogeneous and non-homogeneous equations with constant coefficients, Partial differential equation with variable coefficients reducible to equations with constant coefficients, their complimentary functions and particular Integrals
Oct.17 – 21, 2022	Equations reducible to linear equations with constant coefficients.
Oct.27 – 29, 2022	Classification of linear partial differential equations of second order, Hyperbolic,
Oct.30 – 31; Nov. 2-5, 2022	Classification of linear partial differential equations of second order, parabolic and elliptic types
Nov. 14-19, 2022	Cauchy's problem for second order partial differential equations, Characteristic equations and characteristic curves of second order partial

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	Differentialequation
Nov. 21-26, 2022	Method ofseparationofvariables:SolutionofLaplace'sequation,W aveequation
Nov. 28-30; Dec.1-3, 2022	Diffusion(Heat)equation(oneandtwodimension)
Dec. 5- 10, 2022	Revisionandunittest
Dec. 12- 17, 2022	Revision
Dec. 19- 27, 2022	Revision

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	B.A./B.Sc.-2nd Year (Semester 3) BM – 233: Statics	
2022-2023		
September 1-3, 2022	Composition and resolution of forces	
September 5- 10, 2022	Parallel forces	
September 12- 18, 2022	Moments	
September 19- 24, 2022	Couples.	
Sep. 27-Oct. 1, 2022	Analytical conditions of equilibrium of coplanar forces.	
Oct. 3 – 8, 2022	Friction.	
Oct. 10 – 15, 2022	Centre of Gravity.	
Oct. 17 – 21, 2022	Virtual work.	
Oct. 27 – 29, 2022	Forces in three dimensions.	
Oct. 30 – 31; Nov. 2-5, 2022	Poincaré's central axis.	
Nov. 7-12, 2022	Wrenches.	
Nov. 14-19, 2022	Null lines and planes.	
Nov. 21-26, 2022	Stable and unstable equilibrium.	
Nov. 28-30; Dec. 1-3, 2022	Revision and unit test	
Dec. 5- 10, 2022	Revision and unit test	
Dec. 12- 17, 2022	Revision	
Dec. 19- 27, 2022	Revision	
	B.A./B.Sc. 3rd Year (Semester 5th) BM-351: Real Analysis	
2022-2023		
September 1-3, 2022	Riemann integral	

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September 5- 10, 2022	Integrability of continuous and monotonic functions
September 12- 18, 2022	The Fundamental theorem of integral calculus, Mean value theorems of integral calculus.
September 19- 24, 2022	Improper integrals and their convergence
Sep. 27-Oct. 1, 2022	Abel's and Dirichlet's tests,
Oct. 3 – 8, 2022	Fruillani's integral, Integral as a function of a parameter
Oct. 10 – 15, 2022	Differentiability and integrability of an integral of a function of a parameter.
Oct. 17 – 21, 2022	Definition and examples of metric spaces, neighborhoods, limit points
Oct. 27 – 29, 2022	Interior points, open and closed sets,
Oct. 30 – 31; Nov. 2-5, 2022	Closure and interior, boundary points, subspace of a metric space,
Nov. 7-12, 2022	Equivalent metrics, Cauchy sequences,
Nov. 14-19, 2022	Completeness, Cantor's intersection theorem, Baire's category theorem, contraction Principle
Nov. 21-26, 2022	Continuous functions, uniform continuity
Nov. 28-30; Dec. 1-3, 2022	Sequential compactness, Bolzano-Weierstrass property, continuity in relation with connectedness.
Dec. 5- 10, 2022	Revision and unit test
Dec. 12- 17, 2022	Revision
Dec. 19- 27, 2022	Revision
	B.A./B.Sc. 3rd Year (Semester 5th) BM-352: Groups and Rings
2022-2023	
September 1-3, 2022	Definition of a group with example and simple properties of groups
September 5- 10, 2022	Subgroups and Subgroup criteria
September 12- 18, 2022	Generation of groups, cyclic groups,
September 19- 24, 2022	Cosets, Left and right cosets, Index of a sub-group
Sep. 27-Oct. 1, 2022	Coset decomposition, Lagrange's theorem and its consequences,
Oct. 3 – 8, 2022	Normal subgroups, Quotient groups,
Oct. 10 – 15, 2022	Homomorphisms, isomorphisms

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Oct.17 – 21, 2022	Automorphisms and inner automorphisms of a group
Oct.27 – 29, 2022	Automorphisms of cyclic groups,
Oct.30 – 31; Nov. 2-5, 2022	Permutation groups. Even and odd permutations, Alternating groups
Nov. 7-12, 2022	Cayley's theorem, Center of a group and derived group
Nov. 14-19, 2022	Characteristics of a ring. Ring homomorphisms, ideals
Nov. 21-26, 2022	Euclidean rings, Polynomial rings, Polynomial over the rational field
Nov. 28-30; Dec.1-3, 2022	Unique factorization domain, Unique factorization domain implies $R[X_1, X_2, \dots, X_n]$
Dec. 5- 10, 2022	Revision and unit test
Dec. 12- 17, 2022	Revision
Dec. 19- 27, 2022	Revision

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B.A./B.Sc.3rdYear(Semester5th)B M –353:Numerical Analysis	
2022-2023	
September 1-3, 2022	Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values
September 5- 10, 2022	Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae.
September 12- 18, 2022	Interpolation with unequal intervals: Newton's divided difference
September 19- 24, 2022	Lagrange's Interpolation formulae, Hermite Formula.
Sep. 27-Oct. 1, 2022	Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula.
Oct.3 – 8, 2022	Probability distribution of random variables, Binomial distribution,
Oct.10 – 15, 2022	Poisson's distribution, Normal distribution: Mean, Variance and Fitting
Oct.17 – 21, 2022	Numerical Differentiation: Derivative of a function using interpolation formulae as studied in Sections –I&II.
Oct.27 – 29, 2022	Eigen Value Problems: Power method, Jacobi's method, Given's method, Householder's method, QR method, Lanczos method.
Oct.30 – 31; Nov. 2-5, 2022	Numerical Integration: Newton-Cotes's Quadrature formula, Trapezoidal rule, Simpson's one-third and three-eighths rule
Nov. 7-12, 2022	Single step method Picard's method, Taylor's series method, Euler's method, Runge-Kutta Methods.
Nov. 14-19, 2022	Multiple step methods, Predictor-corrector method,
Nov. 21-26, 2022	Modified Euler's method, Milne-Simpson's method.
Nov. 28-30; Dec.1-3, 2022	Revision and unit test
Dec. 5- 10, 2022	Revision and unit test
Dec. 12- 17, 2022	Revision
Dec. 19- 27, 2022	Revision

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		DYALSINGHCOLLEGE, KARNAL
		LessonPlanforOddSemester
		BC-105, BUSINESSMATHEMATICS-I
		B.ComSemester-1 (Gen/Hons.)
		DepartmentofMathematics
2022-2023		
September 1-3, 2022	Logarithms, Anti-logarithms.	
September 5- 10, 2022	Sequences and Series: Arithmetic progression	
September 12- 18, 2022	Geometric Progressions	
September 19- 24, 2022	Differentiation: Idea of simple derivative of different functions	
Sep. 27-Oct.1, 2022	Rules of differentiation (simple standard forms).	
Oct.3 – 8, 2022	Maxima and Minima of functions of one variable relating to cost	
Oct.10 – 15, 2022	Maxima and Minima of functions of one variable relating to revenue and profit.	
Oct.17 – 21, 2022	Matrices and Determinants: concept of matrix, types, and algebra of matrices	
Oct.27 – 29, 2022	Properties of determinants	
Oct.30 – 31; Nov. 2-5, 2022	Adjoint of a matrix, elementary row or column operations	
Nov. 7-12, 2022	Finding inverse of a matrix through adjoint	
Nov. 14-19, 2022	Solution of a system of linear equations having unique solution	
Nov. 21-26, 2022	Compound Interest	
Nov. 28-30; Dec.1-3, 2022	Annuities: different types of interest rates, concept of present value and amount of a sum	
Dec. 5- 10, 2022	Valuation of simple loans and debentures; problems relating to sinking funds	
Dec. 12- 17, 2022	Revision	
Dec. 19- 27, 2022	Revision	

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		DYALSINGHCOLLEGE, KARNAL
		LessonPlanforOddSemester
		BCA-115 Mathematical Foundations – I
		BCA (First sem.)
		DepartmentofMathematics
2022-2023		
September 1-3, 2022	Set, subsets and operations on sets	
September 5- 10, 2022	Venn diagram of sets	
September 12- 18, 2022	Power set of a set Equivalence relation on a set and partition of a set	
September 19- 24, 2022	Permutation and combinations,	
Sep. 27-Oct.1, 2022	Partially ordered sets, Lattices (definition and examples)	
Oct.3 – 8, 2022	Boolean algebra (definition and examples)	
Oct.10 – 15, 2022	Epsilon and delta definition of the continuity of a function of a single variable	
Oct.17 – 21, 2022	Basic properties of limits	
Oct.27 – 29, 2022	Continuous functions and classifications of discontinuities	
Oct.30 – 31; Nov. 2-5, 2022	Derivative of a function, Derivatives of Logarithmic	
Nov. 7-12, 2022	Formation of differential equations order and degree of the differential equation,	
Nov. 14-19, 2022	Geometrical approach to the existence of the solution of the differential equation	
Nov. 21-26, 2022	Ordinary differential equations of first degree and the first order, exact differential equations	
Nov. 28-30; Dec.1-3, 2022	Linear differential equations of higher order with constant coefficients	
Dec. 5- 10, 2022	Applications of differential equations to geometry	
Dec. 12- 17, 2022	revision and unit test	
Dec. 19- 27, 2022	Revision	

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