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| | **DYAL SINGH COLLEGE,KARNAL** |
| | **Lesson Plan for Odd Semesters** |
| | **Algebra (BM-111)** |
| | **B.A /B.Sc. Semester-1** |
| | **Department of Mathematics** |
| **2018-19** | |
| July 13-14,2018 | Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices, Elementary Operations on matrices. |
| July 16-21,2018 | Rank of a matrices, Inverse of a matrix |
| July 23- 28, 2018 | Ch. Equation of Matrix, |
| July 30-Aug 4,2018 | Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix |
| Aug 6-11, 2018 | Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix |
| Aug 13-18, 2018 | Cayley Hamilton theorem and its use in finding the inverse of a matrix. |
| Aug 20-25, 2018 | Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations, Theorems on consistency of a system of linear equations. |
| Aug 27-Sep 1, 2018 | Unitary and Orthogonal Matrices, Bilinear and Quadratic forms. |
| Sep 3-8, 2018 | Transformation of equation |
| Sep 10-15, 2018 | Relations between the roots and coefficients of general polynomial equation in one variable ,Solutions of polynomial equations having conditions on roots |
| Sep 17-22, 2018 | Common roots and multiple roots. Transformation of equations |
| Sep 24- 29, 2018 | Nature of the roots of an equation,Descarte's rule of signs. |
| Oct 1-6, 2018 | Solutions of cubic equations (Cardon's method) |
| Oct 8- 13, 2018 | Biquadratic equations and their solutions. |
| Oct 15-20, 2018 | Problems discussed relevent to syllabus |
| Oct 22-27,2018 | Unit test |
| Oct 29 – Nov 5, 2018 | Revision |
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| | **B.A/ B.Sc. – first Year (Semester – I)** **BM – 112 : Calculus** |
| **2018-19** | |
| July 13-14,2018 | Definition of the limit of a function. Basic properties of limits, Continuous functions and classification of discontinuities. |
| July 16-21,2018 | Differentiability, Successive differentiation, Leibnitz theorem |
| July 23- 28, 2018 | Maclaurin and Taylor series expansions. |
| July 30-Aug | Asymptotes in Cartesian coordinates, intersection of |

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| 4,2018 | curve and its asymptotes |
| Aug 6-11, 2018 | Asymptotes in polar coordinates. Curvature, radius of curvature for Cartesian curves, |
| Aug 13-18, 2018 | Newton's method. Radius of curvature for pedal curves. Tangential polar equations. |
| Aug 20-25, 2018 | Centre of curvature. Circle of curvature,Chord of curvature, evolutes |
| Aug 27-Sep 1, 2018 | Tests for concavity and convexity, Points of inflexion. Multiple points. |
| Sep 3-8, 2018 | Cusps,nodes & conjugate points, Type of cusps. |
| Sep 10-15, 2018 | Tracing of curves in Cartesian, parametric and polar co-ordinates. |
| Sep 17-22, 2018 | Reduction formulae,Rectification |
| Sep 24- 29, 2018 | Rectification(continued), intrinsic equations of curve, |
| Oct 1-6, 2018 | Quadrature(area)Secotorial area,Area bounded by closed curves |
| Oct 8- 13, 2018 | Volumes and surfaces of solids of revolution, |
| Oct 15-20, 2018 | Theorems of Pappu's and Guilden. |
| Oct 22-27,2018 | Revision and unit test |
| Oct 29 – Nov 5, 2018 | Revision |
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## B.A./B.Sc.– First Year (Semester – I)
## BM – 113 : Solid Geometry

| **2018-19** | |
|---|---|
| July 13-14,2018 | General equation of second degree. |
| July 16-21,2018 | Tracing of conics |
| July 23- 28, 2018 | Tangent at any point to the conic, chord of contact, |
| July 30-Aug 4,2018 | Pole of line to the conic, director circle of conic. System of conics. |
| Aug 6-11, 2018 | Confocal conics. Polar equation of a conic, tangent and normal to the conic. |
| Aug 13-18, 2018 | Sphere: Plane section of a sphere. |
| Aug 20-25, 2018 | Sphere through a given circle, Intersection of two spheres, radical plane of two spheres. |
| Aug 27-Sep 1, 2018 | Co-oxal system of spheres |
| Sep 3-8, 2018 | Cones,Right circular cone, |
| Sep 10-15, 2018 | Enveloping cone and reciprocal cone. |
| Sep 17-22, 2018 | Cylinder: Right circular cylinder and enveloping cylinder |
| Sep 24- 29, 2018 | Central Conicoids: Equation of tangent plane |
| Oct 1-6, 2018 | Director sphere, Normal to the conicoids. |
| Oct 8- 13, 2018 | Polar plane of a point, Enveloping cone of a coincoid |
| Oct 15-20, 2018 | Enveloping cylinder of a conicoid, Generating lines, Confocal conicoid, Reduction of second degreeequations |
| Oct 22-27,2018 | Revision |
| Oct 29 – Nov 5, 2018 | Unit test |
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## B.A/B.Sc- IInd Year (Semester-III)

| | BM-231 Advanced Calculus |
|---|---|
| **2018-19** | |
| July 13-14,2018 | Continuity, Sequential Continuity, properties of continuous functions, Uniform continuity |
| July 16-21,2018 | Chain rule of differentiability. Mean value theorems |
| July 23- 28, 2018 | Rolle's Theorem and Lagrange's mean value theorem and their geometrical interpretations. |
| July 30-Aug 4,2018 | Taylor's Theorem with various forms of remainders, Darboux intermediate value theorem for derivatives |
| Aug 6-11, 2018 | Indeterminate forms. |
| Aug 13-18, 2018 | Limit and continuity of real valued functions of two variables. Partial differentiation.Total Differentials, Composite functions & implicit functions |
| Aug 20-25, 2018 | Change of variables, Homogenous functions & Euler's theorem on homogeneous functions. |
| Aug 27-Sep 1, 2018 | Differentiability of real valued functions of two variables. Schwarz and Young's theorem |
| Sep 3-8, 2018 | Implicit function theorem. Maxima, Minima and saddle points of two variables |
| Sep 10-15, 2018 | Lagrange's method of multipliers. |
| Sep 17-22, 2018 | Curves: Tangents, Principal normal, Binomals, Serret-Frenet formulae. Locus of the centre of curvature |
| Sep 24- 29, 2018 | Spherical curvature, Locus of centre of Spherical curvature, |
| Oct 1-6, 2018 | Involutes, evolutes, Bertrand Curves. |
| Oct 8- 13, 2018 | Surfaces: Tangent planes, one parameter family of surfaces, |
| Oct 15-20, 2018 | Envelopes. |
| Oct 22-27,2018 | Revision and unit test |
| Oct 29 – Nov 5, 2018 | Revision |
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| | **B.A./B.Sc.- 2nd Year (Semester3)** **BM – 232 : Partial Differential Equation** |
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| **2018-19** | |
| July 13-14,2018 | Formation of partial differential equations |
| July 16-21,2018 | Linear and Non-Linear Partial Differential Equation |
| July 23- 28, 2018 | Complete solution, singular solution |
| July 30-Aug 4,2018 | General solution, Solution of Lagrange's linear equations, |
| Aug 6-11, 2018 | Charpit's general method of solution, Compatible systems of first order equations, Jacobi's method. |
| Aug 13-18, 2018 | Linear partial differential equations of second and higher orders, |
| Aug 20-25, 2018 | 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 |

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| | complimentary functions and particular Integrals |
| Aug 27-Sep 1, 2018 | Equations reducible to linear equations with constant coefficients. |
| Sep 3-8, 2018 | Classification of linear partial differential equations of second order, Hyperbolic, |
| Sep 10-15, 2018 | Classification of linear partial differential equations of second order,parabolic and elliptic types |
| Sep 17-22, 2018 | Solution of linear hyperbolic equations, Monge's method for partial differential equations of second order. |
| Sep 24- 29, 2018 | Cauchy' s problem for second order partial differential equations, Characteristic equations and characteristic curves of second order partial differential equation |
| Oct 1-6, 2018 | Method of separation of variables: Solution of Laplace's equation, |
| Oct 8- 13, 2018 | Wave equation |
| Oct 15-20, 2018 | Diffusion (Heat) equation (one and two dimension) |
| Oct 22-27,2018 | Revision and unit test |
| Oct 29 – Nov 5, 2018 | Revision |

### B.A./B.Sc.- 2nd Year (Semester3)
### BM – 233 : Statics

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|---|---|
| **2018-19** | |
| July 13-14,2018 | Composition and resolution of forces |
| July 16-21,2018 | Parallel forces |
| July 23- 28, 2018 | Moments |
| July 30-Aug 4,2018 | Couples. |
| Aug 6-11, 2018 | Analytical conditions of equilibrium of coplanar forces. |
| Aug 13-18, 2018 | Friction. |
| Aug 20-25, 2018 | Centre of Gravity. |
| Aug 27-Sep 1, 2018 | Virtual work. |
| Sep 3-8, 2018 | Forces in three dimensions. |
| Sep 10-15, 2018 | Poinsots central axis. |
| Sep 17-22, 2018 | Wrenches. |
| Sep 24- 29, 2018 | Null lines and planes. |
| Oct 1-6, 2018 | Null lines and planes. |
| Oct 8- 13, 2018 | Stable and unstable equilibrium |
| Oct 15-20, 2018 | Revision |
| Oct 22-27,2018 | Revision and unit test |
| Oct 29 – Nov 5, 2018 | Revision and unit test |

### B.A./B.Sc.3rd Year (Semester 5th)
### BM –351 : Real Analysis

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| **2018-19** | |
| July 13-14,2018 | Riemann integral |

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| July 16-21,2018 | Integrabililty of continuous and monotonic functions |
| July 23- 28, 2018 | The Fundamental theorem of integral calculus, Mean value theorems of integral calculus. |
| July 30-Aug 4,2018 | Improper integrals and their convergence |
| Aug 6-11, 2018 | Abel's and Dirichlet's tests, |
| Aug 13-18, 2018 | Frullani's integral, Integral as a function of a parameter |
| Aug 20-25, 2018 | Differentiability and integrability of an integral of a function of a parameter. |
| Aug 27-Sep 1, 2018 | Definition and examples of metric spaces, neighborhoods, limit points |
| Sep 3-8, 2018 | Interior points, open and closed sets, |
| Sep 10-15, 2018 | Closure and interior, boundary points, subspace of a metric space, |
| Sep 17-22, 2018 | Equivalent metrics, Cauchy sequences, |
| Sep 24- 29, 2018 | Completeness, Cantor's intersection theorem, Baire's category theorem, contraction Principle |
| Oct 1-6, 2018 | Continuous functions, uniform continuity |
| Oct 8- 13, 2018 | Sequential compactness, Bolzano-Weierstrass property, |
| Oct 15-20, 2018 | Continuity in relation with connectedness |
| Oct 22-27,2018 | Revision and unit test |
| Oct 29 – Nov 5, 2018 | Revision and unit test |
| | **B.A./B.Sc.3rd Year (Semester 5th)**<br>**BM –352 : Groups and Rings** |
| **2018-19** | |
| July 13-14,2018 | Definition of a group with example and simple properties of groups |
| July 16-21,2018 | Subgroups and Subgroup criteria |
| July 23- 28, 2018 | Generation of groups, cyclic groups, |
| July 30-Aug 4,2018 | Cosets, Left and right cosets, Index of a sub-group |
| Aug 6-11, 2018 | Coset decomposition, Langrange's theorem and its consequences, |
| Aug 13-18, 2018 | Normal subgroups, Quotient groups, |
| Aug 20-25, 2018 | Homomorphisms, isomophisms |
| Aug 27-Sep 1, 2018 | Automorphisms and inner automorphisms of a group |
| Sep 3-8, 2018 | Automorphisms of cyclic groups, |
| Sep 10-15, 2018 | Permutations groups. Even and odd permutations,Alternating groups |
| Sep 17-22, 2018 | Cayley's theorem, Center of a group and derived group of a group. |
| Sep 24- 29, 2018 | Introduction to rings, subrings, integral domains and fields, |
| Oct 1-6, 2018 | Characteristics of a ring, Ring homomorphisms, ideals |
| Oct 8- 13, 2018 | Euclidean rings, Polynomial rings, Polynomials over the rational field |

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| Oct 15-20, 2018 | Unique factorization domain, R unique factorization domain implies so is R[X1 , X2......Xn] |
| Oct 22-27,2018 | Revision |
| Oct 29 – Nov 5, 2018 | Revision |
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| | **B.A./B.Sc.3rd Year (Semester 5th)**<br>**BM –353 : Numerical Analysis** |
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| **2018-19** | |
| July 13-14,2018 | Finite Differences operators and their relations. Finding the missing terms and effect of error in a difference tabular values |
| July 16-21,2018 | Interpolation with equal intervals: Newton's forward and Newton's backward interpolation formulae. |
| July 23- 28, 2018 | Interpolation with unequal intervals: Newton's divided difference |
| July 30-Aug 4,2018 | Lagrange's Interpolation formulae, Hermite Formula. |
| Aug 6-11, 2018 | Central Differences: Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula. |
| Aug 13-18, 2018 | Probability distribution of random variables, Binomial distribution, |
| Aug 20-25, 2018 | Poisson's distribution, Normal distribution: Mean, Variance and Fitting. |
| Aug 27-Sep 1, 2018 | Numerical Differentiation: Derivative of a function using interpolation formulae as studied in Sections –I & II. |
| Sep 3-8, 2018 | Eigen Value Problems: Power method, Jacobi's method, Given's method, Householder's method, QR method, Lanczos method. |
| Sep 10-15, 2018 | Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule, Simpson's one- third and three-eighth rule |
| Sep 17-22, 2018 | Single step methods, Picard's method. Taylor's series method, Euler's method, Runge-Kutta Methods. |
| Sep 24- 29, 2018 | Multiple step methods, Predictor-corrector method, |
| Oct 1-6, 2018 | Modified Euler's method, |
| Oct 8- 13, 2018 | Milne-Simpson's method |
| Oct 15-20, 2018 | Revision and unit test |
| Oct 22-27,2018 | Revision and unit test |
| Oct 29 – Nov 5, 2018 | Revision and unit test |
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| | **Lesson plan for even sem**<br>**B.A./B.Sc. IstYear (Semester 2nd)**<br>**BM –121 : Number Theory and Trigonometry** |
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| **Even Sem** | |

| 2018-19 | |
|---|---|
| Jan 1-5, 2019 | Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple) |
| Jan 7-12, 2019 | Primes, Fundamental Theorem of Arithmetic. |
| Jan 14-19, 2019 | Linear Congruences, Fermat's theorem. |
| Jan 21-25,2019 | Wilson's theorem and its converse. |
| Jan 28- Feb 2, 2019 | Linear Diophanatine equations in two variables |
| Feb 4-9, 2019 | Complete residue system and reduced residue system modulo m. Euler function Euler's generalization of Fermat's theorem |
| Feb 11-16, 2019 | Chinese Remainder Theorem. Quadratic residues. Legendre symbols. |
| Feb 18-23, 2019 | Lemma of Gauss; Gauss reciprocity law. Greatest integer function [x]. |
| Feb 25-March 2, 2019 | The number of divisors and the sum of divisors of a natural number n (The functions d(n) and s (n)). Moebius function and Moebius inversion formula. |
| March 4-9, 2019 | De Moivre's Theorem and its Applications. |
| March 11-16, 2019 | Expansion of trigonometrical functions, Direct circular and hyperbolic functions and their properties. |
| March, 25-30, 2019 | Inverse circular and hyperbolic functions and their properties. |
| April 1- 6,2019 | Logarithm of a complex quantity |
| April 8-13,2019 | Gregory's series. |
| April 15-20,2019 | Summation of Trigonometry series |
| April 22-27,2019 | Revision and unit test |
| April 29-30,2019 | Revision |
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**B.A./B.Sc. IstYear (Semester 2nd)**
**BM –122:Ordinary Differential Equations**

| Even Sem | |
|---|---|
| 2018-19 | |
| Jan 1-5, 2019 | Geometrical meaning of a differential equation. Exact differential equations |
| Jan 7-12, 2019 | Integrating factors. First order higher degree equations |
| Jan 14-19, 2019 | Solvable for x,y,p Lagrange's equations, |
| Jan 21-25,2019 | Clairaut's equations, Equation reducible to Clairaut's form Singular solutions. |
| Jan 28- Feb 2, 2019 | Orthogonal trajectories in Cartesian coordinates and polar coordinates |
| Feb 4-9, 2019 | Self orthogonal family of curves, Linear differential equations with constant coefficients. |
| Feb 11-16, 2019 | Homogeneous linear ordinary differential equations. Equations reducible to homogeneous |
| Feb 18-23, 2019 | Linear differential equations of second order: |

| | Reduction to normal form. |
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| Feb 25-March 2, 2019 | Transformation of the equation by changing the dependent variable/ the independent variable |
| March 4-9, 2019 | Solution by operators of non-homogeneous linear differential equations. |
| March 11-16, 2019 | Reduction of order of a differential equation. Method of variations of parameters. Method of undetermined coefficients. |
| March, 25-30, 2019 | Ordinary simultaneous differential equations. |
| April 1- 6,2019 | Solution of simultaneous differential equations involving operators x (d/dx) or t (d/dt) etc |
| April 8-13,2019 | Simultaneous equation of the form dx/P = dy/Q = dz/R. Total differential equations. |
| April 15-20,2019 | Condition for Pdx + Qdy +Rdz = 0 to be exact |
| April 22-27,2019 | Revision |
| April 29-30,2019 | Unit test |
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| B.A./B.Sc. IstYear (Semester 2nd) BM –123:Vector Calculus | |
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| **Even Sem** | |
| **2018-19** | |
| Jan 1-5, 2019 | Scalar and vector product of three vectors, |
| Jan 7-12, 2019 | Product of four vectors, Reciprocal vectors. |
| Jan 14-19, 2019 | Vector differentiation Scalar Valued point functions, |
| Jan 21-25,2019 | Vector valued point functions, derivative along a curve, directional derivatives |
| Jan 28- Feb 2, 2019 | Gradient of a scalar point function, geometrical interpretation of grad F , |
| Feb 4-9, 2019 | Character of gradient as a point function |
| Feb 11-16, 2019 | Divergence and curl of vector point function, characters of Div f and Curl f as point function, examples. |
| Feb 18-23, 2019 | Gradient, divergence and curl of sums and product and their related vector identities. |
| Feb 25-March 2, 2019 | Orthogonal curvilinear coordinates Conditions for orthogonality fundamental triad of mutually orthogonal unit vectors |
| March 4-9, 2019 | Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates, |
| March 11-16, 2019 | Cylindrical co-ordinates and Spherical coordinates. |
| March, 25-30, 2019 | Vector integration |
| April 1- 6,2019 | Line integral |
| April 8-13,2019 | Surface integral |
| April 15-20,2019 | Volume integral |
| April 22-27,2019 | Revision |
| April 29-30,2019 | Unit Test |
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| | B.A. /B.Sc. - IInd Year (Semester – IV) BM -241 : SEQUENCES AND SERIES |
|---|---|
| **2018-19** | |
| Jan 1-5, 2019 | Boundedness of the set of real numbers, least upper bound, greatest lower bound of a set, |
| Jan 7-12, 2019 | Neighborhoods, interior points, isolated points, limit points, |
| Jan 14-19, 2019 | Open sets, closed set, interior of a set, closure of a set in real numbers and their properties. |
| Jan 21-25,2019 | Bolzano- Weiestrass theorem, Open covers, Compact sets and Heine-Borel Theorem |
| Jan 28- Feb 2, 2019 | Sequence: Real Sequences and their convergence, |
| Feb 4-9, 2019 | Theorem on limits of sequence, Bounded and monotonic sequences, Cauchy's sequence, |
| Feb 11-16, 2019 | Cauchy general principle of convergence, Subsequences, Subsequential limits. Infinite series: Convergence and divergence of |
| Feb 18-23, 2019 | Infinite series: Convergence and divergence of Infinite Series, Comparison Tests of positive terms Infinite series |
| Feb 25-March 2, 2019 | Cauchy' s general principle of Convergence of series, Convergence and divergence of geometric series, |
| March 4-9, 2019 | Infinite series: D-Alembert's ratio test, Raabe's test |
| March 11-16, 2019 | Logarithmic test, de Morgan and Bertrand's test, |
| March, 25-30, 2019 | Cauchy's Nth root test, Gauss Test, Cauchy's integral test,Cauchy's condensation test,Alternating series, Leibnitz's test, absolute and conditional convergence |
| April 1- 6,2019 | Arbitrary series: abel's lemma, Abel's test, Dirichlet's test |
| April 8-13,2019 | Insertion and removal of parenthesis,Dirichlet's theorem, |
| April 15-20,2019 | Riemann's Re-arrangement theorem, Pringsheim's theorem |
| April 22-27,2019 | Revision |
| April 29-30,2019 | Test |
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| | **B.A./B.Sc. 2ndYear (Semester 4th) BM –242:Special Functions and Integral Transforms** |
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| **2018-19** | |
| Jan 1-5, 2019 | Power series method |
| Jan 7-12, 2019 | Definitions of Beta and Gamma functions. Bessel equation and its solution |
| Jan 14-19, 2019 | Convergence, recurrence, Relations and generating functions, Orthogonality of Bessel functions. |

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| Jan 21-25,2019 | Legendre and Hermite differentials equations and their solutions: |
| Jan 28- Feb 2, 2019 | Legendre and Hermite functions and their properties-Recurrence Relations and generating functions |
| Feb 4-9, 2019 | Orhogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials |
| Feb 11-16, 2019 | Laplace Integral Representation of Legendre polynomial. |
| Feb 18-23, 2019 | Laplace Transforms – Existence theorem for Laplace transforms, |
| Feb 25-March 2, 2019 | Shifting theorems, Laplace transforms of derivatives and integrals, |
| March 4-9, 2019 | Convolution theorem, Inverse Laplace transforms, convolution theorem |
| March 11-16, 2019 | Inverse Laplace transforms of derivatives and integrals, |
| March, 25-30, 2019 | Fourier transforms: Linearity property, Shifting, Modulation, Convolution |
| April 1- 6,2019 | Fourier Transform of Derivatives, |
| April 8-13,2019 | Relations between Fourier transform and Laplace transform |
| April 15-20,2019 | Parseval's identity for Fourier transforms, |
| April 22-27,2019 | Revision |
| April 29-30,2019 | Unit test |
| | **B.A./B.Sc. 2ndYear (Semester 4th)** <br> **BM –243: Programming in C&Numerical Methods** |
| **2018-19** | |
| Jan 1-5, 2019 | Programmer's model of a computer, |
| Jan 7-12, 2019 | Algorithms, Flow charts, Data types, |
| Jan 14-19, 2019 | Operators and expressions, Input / outputs functions. S |
| Jan 21-25,2019 | Decisions control structure: Decision statements, |
| Jan 28- Feb 2, 2019 | Implementation of Loops, Switch Statement & Case control structures |
| Feb 4-9, 2019 | Functions, Preprocessors and Arrays. |
| Feb 11-16, 2019 | Strings: Character Data Type, Standard String handling Functions |
| Feb 18-23, 2019 | Arrays in Structures, Pointers Data type, Pointers and Arrays, Pointers and Functions. |
| Feb 25-March 2, 2019 | Bisection method, |
| March 4-9, 2019 | Regula-Falsi method, Secant method, |
| March 11-16, 2019 | Newton-Raphson's method, Newton's iterative method for finding pth root of a number, |
| March, 25-30, 2019 | Order of convergence of above methods. |

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| April 1- 6,2019 | Gauss-elimination method, Gauss-Jordan method,.Crout's method. |
| April 8-13,2019 | Triangularization method (LU decomposition method) |
| April 15-20,2019 | Cholesky Decomposition method |
| April 22-27,2019 | Revision |
| April 29-30,2019 | Unit test |

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**B.A./B.Sc. 3<sup>rd</sup> Year (6<sup>th</sup>sem)**

**BM –361 Real and complex Analysis**

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| 2018-19 | |
|---|---|
| Jan 1-5, 2019 | Jacobians, Beta and Gama functions, |
| Jan 7-12, 2019 | Double and Triple integrals, |
| Jan 14-19, 2019 | Dirichlet's integrals, change of order of integration in double integrals. |
| Jan 21-25,2019 | Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Coefficients, |
| Jan 28- Feb 2, 2019 | Dirichlet's conditions, Parseval's identity for Fourier series, |
| Feb 4-9, 2019 | Fourier series for even and odd functions, Half range series, Change of Intervals. |
| Feb 11-16, 2019 | Extended Complex Plane, Stereographic projection of complex numbers |
| Feb 18-23, 2019 | Continuity and differentiability of complex functions, Analytic functions, |
| Feb 25-March 2, 2019 | Cauchy-Riemann equations. Harmonic functions. |
| March 4-9, 2019 | Mappings by elementary functions |
| March 11-16, 2019 | Translation, rotation, Magnification and Inversion. |
| March, 25-30, 2019 | Conformal Mappings |
| April 1- 6,2019 | Mobius transformations. |
| April 8-13,2019 | Fixed points, Cross ratio |
| April 15-20,2019 | Inverse Points and critical mappings.Fixed points, Cross ratio, |
| April 22-27,2019 | Revision |
| April 29-30,2019 | Unit test |

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**B.A./B.Sc. 3rdYear (Semester 6th)**

**BM –362 Linear Algebra**

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| 2018-19 | |
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| Jan 1-5, 2019 | Vector spaces, subspaces, Sum and Direct sum of subspaces, |
| Jan 7-12, 2019 | Linear span, Linearly Independent and dependent subsets of a vector space |
| Jan 14-19, 2019 | Finitely generated vector space, Existence theorem for basis of a finitely generated vector space |
| Jan 21-25,2019 | Finite dimensional vector spaces, Invariance of the number of elements of bases sets, |

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| Jan 28- Feb 2,2019 | Dimensions, Quotient space and its dimension. |
| Feb 4-9, 2019 | Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces |
| Feb 11-16, 2019 | Dual Spaces, Bidual spaces, annihilator of subspaces of finite dimensional vector spaces |
| Feb 18-23, 2019 | Null Space, Range space of a linear transformation, Rank and Nullity Theorem |
| Feb 25-March 2, 2019 | Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations |
| March 4-9, 2019 | Matrix of a linear Transformation, Change of basis, Eigen values and Eigen vectors of linear transformations |
| March 11-16, 2019 | Inner product spaces, Cauchy-Schwarz inequality |
| March, 25-30, 2019 | Orthogonal vectors, Orthogonal complements, Orthogonal sets and Basis |
| April 1- 6,2019 | Bessel's inequality for finite dimensional vector spaces,Unitary linear transformations |
| April 8-13,2019 | Gram-Schmidt Orthogonalization process, Adjoint of a linear transformation |
| April 15-20,2019 | Unitary linear transformations |
| April 22-27,2019 | Revision |
| April 29-30,2019 | Unit test |
| | **B.A./B.Sc. 3rdYear (Semester 6th)** |
| | **BM –363 Dynamics** |
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| **2018-19** | |
| Jan 1-5, 2019 | Velocity and acceleration along radial, transverse |
| Jan 7-12, 2019 | Tangential and normal directions |
| Jan 14-19, 2019 | Relative velocity and acceleration. |
| Jan 21-25,2019 | Simple harmonic motion. Elastic strings. |
| Jan 28- Feb 2, 2019 | Mass, Momentum and Force |
| Feb 4-9, 2019 | Newton's laws of motion. |
| Feb 11-16, 2019 | Work, Power and Energy. |
| Feb 18-23, 2019 | Definitions of Conservative forces and Impulsive forces |
| Feb 25-March 2, 2019 | Motion on smooth and rough plane curves |
| March 4-9, 2019 | Projectile motion of a particle in a plane. |
| March 11-16, 2019 | Vector angular velocity |
| March, 25-30, 2019 | General motion of a rigid body |
| April 1- 6,2019 | Central Orbits, |
| April 8-13,2019 | Kepler laws of motion |
| April 15-20,2019 | Motion of a particle in three dimensions. |

| April 22-27,2019 | Revision |
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| April 29-30,2019 | Unit test |

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| | LessonPlanforOddSemester |
| | BC-105, BUSINESSMATHEMATICS-I |
| | B.ComSemester-1 (Gen/Hons.) |
| | DepartmentofMathematics |
| **2018-19** | |
| July13-14,2018 | Logarithms, Anti-logarithms. |
| July16-21,2018 | Sequences and Series: Arithmetic progression |
| July23-28,2018 | Geometric Progressions |
| July 30-Aug4,2018 | Differentiation: Idea of simple derivative of different functions |
| Aug 6-11,2018 | Rules of differentiation (simple standard forms). |
| Aug 13-18,2018 | Maxima and Minima of functions of one variablerelating to cost |
| Aug 20-25,2018 | Maxima and Minima of functions of one variable relating to revenue and profit. |
| Aug 27-Sep 1, 2018 | Matrices and Determinants: concept of matrix, types, and algebra of matrices |
| Sep3-8,2018 | Properties of determinants |
| Sep10-15,2018 | Adjoint of a matrix, elementary row or columnoperations |
| Sep17-22,2018 | Finding inverse of a matrix through adjoint |
| Sep 24-29,2018 | Solution of a system of linear equations having unique solution |
| Oct1-6,2018 | Compound Interest |
| Oct8-13,2018 | Annuities: different types of interest rates, concept of present value and amount of a sum |
| Oct15-20,2018 | Valuation of simple loans and debentures; problems relating to sinking funds |
| Oct22-27,2018 | Revision |
| Oct29–Nov5,2018 | Revision |

| | B.Com 2nd Sem. General /Hons.BC-205 BUSINESS MATHEMATICS-II |
|---|---|
| **Even Sem** | |
| **2018-19** | |
| Jan1-5,2019 | Permutations and Combinations |
| Jan7-12,2019 | Binomial Theorem |
| Jan14-19,2019 | Linear inequalities: graphical solution of linear inequalities in two variables |
| Jan21-25,2019 | Solution of system of linear inequalities in two variables |
| Jan28-Feb2, 2019 | Graphical method of solution |
| Feb4-9,2019 | Problems relating to two variables including the case of mixed constraints |
| Feb11-16,2019 | Multiple solutions, unbounded solution and redundant constraints. |
| Feb18-23,2019 | Data representation and interpretation: introduction, classification and tabulation of data |
| Feb25-March2, 2019 | Diagrammatic and graphic representation of data |
| March4-9,2019 | Significance of diagrams and graphs, |
| March11-16,2019 | Types of diagrams: bar diagram |
| March, 25-30, 2019 | Types of diagrams: pie chart, pictographs, graphs of time series |
| April1-6,2019 | Line graphs; graphs of frequency distribution |
| April8-13,2019 | Histogram, frequency polygon |
| April15-20,2019 | Ogives or cumulative frequency curves, limitations of diagrams and graphs |
| April22-27,2019 | Revision and unit test |
| April29-30,2019 | Revision |
| | **DYALSINGHCOLLEGE, KARNAL** |
| | **LessonPlanforOddSemester** |
| | **BCA-115 Mathematical Foundations – I** |
| | **BCA (First sem.)** |
| | **DepartmentofMathematics** |
| **2018-19** | |
| July13-14,2018 | Set, subsets and operations on sets |
| July16-21,2018 | Venn diagram of sets |

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| July23-28,2018 | Power set of a set Equivalence relation on a set and partition of a set |
| July 30-Aug4,2018 | Permutation and combinations, |
| Aug 6-11,2018 | Partially ordered sets, Lattices (definition and examples) |
| Aug 13-18,2018 | Boolean algebra (definition and examples) |
| Aug 20-25,2018 | Epsilon and delta definition of the continuity of a function of a single variable |
| Aug 27-Sep 1, 2018 | Basic properties of limits |
| Sep3-8,2018 | Continuous functions and classifications of discontinuities |
| Sep10-15,2018 | Derivative of a function, Derivatives of Logarithmic |
| Sep17-22,2018 | Formation of differential equations order and degree of the differential equation, |
| Sep 24-29,2018 | Geometrical approach to the existence of the solution of the differential equation |
| Oct1-6,2018 | Ordinary differential equations of first degree and the first order, exact differential equations |
| Oct8-13,2018 | Linear differential equations of higher order with constant coefficients |
| Oct15-20,2018 | Applications of differential equations to geometry |
| Oct22-27,2018 | revision and unit test |
| Oct29–Nov5,2018 | Revision |

| | **BCA – 124**<br>**Mathematical Foundation(II)**<br>**Second semester** |
|---|---|
| **Even Sem** | |
| **2018-19** | |
| Jan1-5,2019 | Propositions and logical operators, Truth tables and propositions generated by a set |
| Jan7-12,2019 | Equivalence and implications, Laws of logic |
| Jan14-19,2019 | Mathematical system, Proposition over a universe |
| Jan21-25,2019 | Mathematical induction, Quantifiers |
| Jan28-Feb2, 2019 | Binary operations on a non empty set, |
| Feb4-9,2019 | Groups, Subgroups, Normal Subgroups, Cosets, Factor groups |

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| Feb11-16,2019 | Rings, Sub rings, Ideals, Factor rings, Prime ideals, Minimal ideal, Fields, direct product of groups |
| Feb18-23,2019 | Isomorphism of groups and rings |
| Feb25-March2, 2019 | Addition and multiplication of matrices, Laws of matrix algebra |
| March4-9,2019 | Singular and non singular matrices, Inverse of a matrix |
| March11-16,2019 | Rank of a matrix, Rank of the product of two matrices |
| March, 25-30, 2019 | Characteristic equations of a square matrix |
| April1-6,2019 | Cayley-Hamilton Theorem, Eigen values and eigen vectors |
| April8-13,2019 | Eigen values and eigen vectors of symmetric skew symmetric, Hermitian and skew – Hermitan matrices |
| April15-20,2019 | Diagonalization of a square matrix |
| April22-27,2019 | revision and unit test |
| April29-30,2019 | revision |

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