

Lesson Plan

(Session November-2020 to March-2021)

Name of Teachers : Ms Aarju, Ms Aarti

Class: B.Sc.-I (NM+CS) and BA-I

Paper: Algebra

| Date | Topics |
|----------------------|---|
| 16.11.20 to 21.11.20 | Definition of matrix and type of matrices |
| 23.11.20 to 28.11.20 | Definition of hermitian, skew hermitian matrix and question related to these matrices |
| 30.11.20 to 05.12.20 | Rank of matrix, elementary operations, row echelon matrix |
| 07.12.20 to 12.12.20 | Normal form of a matrix, elementary matrices |
| 14.12.20 to 19.12.20 | Linear dependence and independent of row and column matrices |
| 21.12.20 to 26.12.20 | Characteristic equation of a matrix, cayley Hamilton theorem |
| 28.12.20 to 02.01.21 | Minimal equation and exercise problem |
| 04.01.21 to 09.01.21 | Solution of System of linear equations by matrices |
| 11.01.21 to 16.01.21 | Orthogonal and unitary matrices and assignment |
| 18.01.21 to 23.01.21 | Exercise problem and class test |
| 25.01.21 to 30.01.21 | Bilinear and quadratic forms |
| 01.02.21 to 06.02.21 | Roots of an equation and synthetic division and unit test |
| 08.02.21 to 13.02.21 | Relation between roots and co-efficient of an equation |
| 15.02.21 to 20.02.21 | Transformation of equations |
| 22.02.21 to 27.02.21 | Solution of cubic and biquadratic equations |
| 01.03.21 to 06.03.21 | Descartes rule of signs |
| 08.03.21 to 13.03.21 | Revision |

Lesson Plan

Name of Teacher: Dr. Sanjay Kumar

Class : BA-I, B.Sc.-I (NM & CS)

Subject: Calculus (CML 107)

| Month | Topics Covered |
|----------|--|
| November | Limit, continuity (– definition), Types of Discontinuities and differentiability of functions. Successive differentiation of functions in implicit, explicit and parametric form. Leibnitz theorem. Some general theorems on differentiable functions and expansions. |
| December | Taylor's theorem with Lagrange's form and Cauchy's form of remainder after 'n' terms. Maclaurin form and Infinite Series. Asymptotes parallel to coordinate axis and Oblique Asymptotes in Cartesian and Polar form. Singular points. Points of inflexion. Multiple points. Cusps, nodes & conjugate points. Tracing of curves in Cartesian, parametric and polar co-ordinates, particularly, Asteroid, Cycloid and Cardoid. & Test-1 |
| January | Curvature (radius of curvature for Cartesian curve, parametric curves, polar curves, pedal curves). Reduction formulae. Rectification, length of curves in Cartesian, parametric and polar curves particularly Asteroid, Cycloid and Cardoid., intrinsic equations of curve. & Assignment |
| February | Quadrature (area) Sectorial area. Area bounded by closed curves in Cartesian, parametric form and polar form. Volumes and surfaces of solids of revolution about x-axis and about any line. & Test-2 |

Lesson Plan 2020-21

Name of Teacher : Dr. Renu Sheoran

Subject: Advanced Calculus

Class: B.Sc./B.A.3rd Sem

| SR. NO. | MONTH | PERIOD | TOPICS |
|---------|----------|---|--|
| 1. | NOVEMBER | 3rd week Last week | 1. Indeterminate forms 2. Limit and continuity of real valued functions of two variables. 3. Partial differentiation, Total differentials. 4. Darboux intermediate value theorem for derivatives, Composite functions and implicit functions, |
| 2. | DECEMBER | 1 st week 2 nd week 3 rd week Last week | 1. Change of variables, Homogeneous functions. Euler's theorem on homogeneous functions, 2. Taylor's theorem for functions of two variables. 3.. Differentiability of real valued functions of two variables. 4. Schwarz and Young's theorem, Implicit function theorem. |
| 3. | JANUARY | 1 st week 2 nd week 3 rd week Last week | 1. Maxima, Minima and saddle points of two variables. Lagrange's method of multipliers. 2. Continuity, Sequential continuity, properties of continuous functions, Uniform continuity. Taylor's theorem with various form of remainders. 3 Chain rule of differentiability, Mean value theorems, 4. Rolle's theorem and Lagrange's mean value theorem and their geometrical interpretations. |
| 4. | FEBRUARY | 1 st week 2 nd week 3 rd week Last week | 1. Taylor's theorem with various form of remainders. Darboux intermediate value theorem for derivatives 2.. Jacobians, Beta and Gamma Functions 3. Double and Triple Integral, 4. Dirichlet's Integral and Change of order of Integration |

Lesson Plan
(Session November-2020 to March-2021)

Name of Teacher: Ms. Aarju

Subject: Numerical Analysis

Class: B. Sc (NM), B. Sc (CS) & B.A 2nd year

| SR. NO. | MONTHS | PERIOD | TOPICS |
|---------|----------|---|---|
| 1. | November | 3 rd week Last week | 1. Finite difference operators and their relations, Difference table, Finding the missing terms and effect of error in a difference tabular values. Interpolation with equal intervals: derivations of Newton's forward and Newton's backward interpolation formulae and their applications. 2. Interpolation with unequal intervals: Newton's divided difference, Lagrange's Interpolation formulae and their applications. Central Differences Interpolation formulae : derivations of Gauss's forward and Gauss backward interpolation formulae, Sterling, Bessel formulae and their applications |
| 2. | December | 1 st week 2 nd week 3 rd week Last week | 1. Numerical Differentiation: Relation between difference operator and derivative operator, Derivative of a function using interpolation formulae. 2. Numerical Intergration: Newton-Cote's Quadrature formula. Simpson's one-third rule and Simpson's three-eight rule. 3. Chebychev formula, Gauss Quadrature formula. 4. Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi Method and assignment. |
| 3. | January | 1 st week 2 nd week 3 rd week Last week | 1. Secant method, Newton-Raphson's. 2. Newton's iterative method for finding p-th root of a number. 3. Simultaneous Linear algebraic equations: Gauss-Elimination Method, Gauss- Jordan Method, 4. Triangularization method(LU decomposition method) and Unit test. |
| 4 | February | 1 st week 2 nd week 3 rd week Last week | Iterative method, Jacobi's method. Gauss-Seidal's method, Relaxation method. Revision Unit I Revision Unit II |
| 5 | March | 1 st week 2 nd week | Revision Unit III Revision Unit IV |

Govt. College For Women Hisar

Lesson Plan 2020-21

Name of Teacher : Ms. Deepal

Subject: Group and Rings

Class: B. Sc./B.A.5thSem

| Sr. No. | MONTH | PERIOD | TOPICS |
|---------|-------|---|---|
| 1. | NOV | 3 rd week Last week | Binary operations, Definition of groups, abelian group, order of group and their related problems. Integral powers related problems. Order of an element and their related problems. Subgroups and its related theorems and problems. Cyclic group, related theorem and problems. Cosets, solved examples. Index of a subgroup in group |
| 2. | DEC | 1 st week 2 nd week 3 rd week Last week | Normal subgroups, simple groups, quotient group and their related theorem and problems. Homomorphisms of groups, isomorphisms, kernel of homomorphisms. Automorphism of a group and related theorems, centre of group, characteristic of subgroups. Commutator, permutations, symmetric group, transposition, alternating group, cayley theorem. |
| 3. | JAN | 1 st week 2 nd week 3 rd week Last week | Ring, ring without or with zero divisor, subrings, characteristic of a ring. Ideals, maximal and prime ideal, ring homomorphisms Kernel of ring homomorphisms, embedding of rings Euclidean rings, principal ideal domain and their related theorems and problems. |
| 4. | FEB | 1 st week 2 nd week 3 rd week Last week | Polynomial rings, polynomial over an integral domain and field and related theorems and problems Divisibility of polynomials over a field, unique factorization domain Primitive polynomial, Gauss lemma, field of quotient of a UFD, Eisenstein's irreducibility criterion Revision |

Lesson Plan 2020-21

Name of Teacher : Ms. Sonal Rani

Subject: Sequence & Series

Class: B. Sc./B.A.5thSem

| Sr. No. | MONTH | PERIOD | TOPICS |
|---------|-------|---|---|
| 1. | NOV | 3 rd week Last week | 1. 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. 2. Bolzano-Weierstrass theorem, Open covers, Compact sets and Heine-Borel Theorem. 3. Sequence: Real Sequences and their convergence, Theorem on limits of sequence, Bounded and monotonic sequences 4. Cauchy's sequence, Cauchy general principle of convergence, Subsequences, Subsequential limits. |
| 2. | DEC | 1 st week 2 nd week 3 rd week Last week | 1. 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. 2. Hyper Harmonic series or p-series. Infinite series: D-Alembert's ratio test, Raabe's test, Logarithmic test, de Morgan and Bertrand's test. 3. Cauchy's Nth root test, Gauss Test, Cauchy's integral test, Cauchy's condensation test. 4. Alternating series, Leibnitz's test, absolute and conditional convergence, Arbitrary series: Abel's lemma, Abel's test, Dirichlet's test & Test-1 |
| 3. | JAN | 1 st week 2 nd week 3 rd week Last week | 1. Fourier's series: Fourier expansion of piecewise monotonic functions. 2. Properties of Fourier Co-efficients, Dirichlet's conditions. 3. Parseval's identity for Fourier series. 4. Fourier series for even and odd functions, Half range series, Change of Intervals & Assignment. |
| 4. | FEB | 1 st week 2 nd week 3 rd week Last week | 1. Riemann integral, Darboux's theorem, Integrability of continuous and monotonic functions. 2. The Fundamental theorem of integral calculus. 3. Mean value theorems of integral calculus & Test-2 4. Revision |
| 5. | MARCH | 1 st week 2 nd week 3 rd week | Revision of 1 st unit Revision of 2 nd unit Revision of 3 rd & 4 th unit |

Lesson Plan

Name of Teacher : Mr. Anil Kumar

Class and Section : B.A.-III, B.Sc.-III(C.S.) and B.Sc.-III(N.M.)

Subject : Number Theory And Trigonometry

| Weeks | Topics |
|-----------------------|--|
| 16.11.2020-21.11.2020 | Divisibility: 1.1 Introduction 1.2 The Principal of Mathematical Induction 1.3 Divisibility 1.4 Some Important Definitions and Results 1.5 Theorems on Divisibility Examples Problems |
| 23.11.2020-28.11.2020 | 1.6 Division Algorithm 1.7 Greatest Common Divisor and Least Common Multiple 1.8 Some Theorems on G.C.D. and L.C.M. 1.9 Some Important Definitions 1.10 Some Theorems on prime Numbers 1.11 Fundamental Theorems of Arithmetic 1.12 Standard Form OR Canonical Form Examples Problems |
| 30.11.2020-05.12.2020 | Congruences: 2.1 Moduli of Integers 2.2 Congruences 2.3 Theorems on Congruences 2.4 Linear Congruences 2.5 Linear Diophantine Equations 2.6 Some Important Theorems Examples Problems |
| 07.12.2020-12.12.2020 | Fermat's, Wilson's and Chinese Remainder Theorems 3.1 Introduction 3.2 Theorems and Fermat's Theorem 3.3 Wilson's Theorem 3.4 Converse of Wilson's Theorem 3.5 Some Other Theorems Examples Problems |
| 14.12.2020-19.12.2020 | 3.6 Simultaneous Linear Congruences 3.7 Chinese Remainder Theorems Examples Problems |
| 21.12.2020-26.12.2020 | Euler's Function and Residue Systems (mod m) 4.1 Introduction 4.2 Euler's Function (ϕ -Function) 4.3 Multiplicative Function 4.4 Some Theorems on ϕ -Function 4.5 Residues 4.6 Complete Residue System (mod m) 4.7 Reduced Residue System (mod m) 4.8 Some Important Theorems on Residue System (mod m) 4.9 Euler's Generalization of Fermat's Theorem Examples Problems |

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| 28.12.2020-02.01.2021 | <p>Some Functions of Number Theory</p> <p>5.1 Introduction</p> <p>5.2 Greatest Integer Function (Bracket Function)</p> <p>5.3 Some Theorems on Bracket Function</p> <p>5.4 de Polignac's Formula</p> <p>5.5 Arithmetic Functions</p> <p>5.6 Divisor Function of n</p> <p>5.7 Sigma Function of n</p> <p>5.8 Perfect Number</p> <p>Examples</p> <p>Problems</p> <p>Examples</p> <p>Problems</p> |
| 04.01.2021-09.01.2021 | <p>5.9 Some Theorems on $d(n)$ and $\sigma(n)$</p> <p>5.10 The Mobius Function</p> <p>5.11 Mobius Inversion Formula</p> <p>5.12 Converse of Mobius Inversion Formula</p> <p>Examples</p> <p>Problems</p> |
| 11.01.2021-16.01.2021 | <p>Quadratic Residues And Quadratic Reciprocity Law</p> <p>6.1 Introduction</p> <p>6.2 Quadratic Congruences</p> <p>6.3 Quadratic Residues</p> <p>6.4 Theorems Related to Quadratic Residues</p> <p>Examples</p> <p>Problems</p> |
| 18.01.2021-23.01.2021 | <p>6.5 Legendre Symbol</p> <p>6.6 Euler's Criterion Using Legendre Symbol</p> <p>6.7 Properties of Legendre Symbol</p> <p>6.8 Gauss Lemma</p> <p>6.9 Theorems</p> <p>6.10 Gauss Reciprocity Law (Quadratic Reciprocity law)</p> <p>Examples and Problems</p> |
| 25.01.2021-30.01.2021 | <p>De Moivre's Theorem And Its Applications</p> <p>De Moivre's Theorem</p> <p>De Moivre's Theorem</p> <p>7.1 De Moivre's Theorem</p> <p>7.2 Roots of a Complex Number</p> <p>7.3 Solutions of Equations</p> <p>Examples</p> <p>Problems</p> |
| 01.02.2021-06.02.2021 | <p>7.4 Expansion of Trigonometric Functions</p> <p>7.5 Formation of Equations</p> <p>7.6 Expansion of Trigonometric Functions in Terms of Multiple Angles</p> <p>Examples</p> <p>Problems</p> |
| 08.02.2021-13.02.2021 | <p>Circular Functions of a Complex Variable</p> <p>8.1 Introduction</p> <p>8.2 Exponential Functions of a Complex Variable</p> <p>8.3 Properties of Exponential Functions</p> <p>8.4 Circular Functions of Complex Variables</p> <p>8.5 Euler's Theorem</p> <p>8.6 De Moivre's Theorem for Complex Variables</p> <p>8.7 Periodicity of Circular Functions</p> <p>8.8 Trigonometrical Formulae for Complex Quantities</p> <p>Examples</p> <p>Problems</p> |
| 15.02.2021-20.02.2021 | <p>Hyperbolic Functions</p> <p>Relation Between Hyperbolic and Circular Functions</p> |

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| | <p>Relation Between Hyperbolic and Circular Functions</p> <p>9.1 Hyperbolic Functions</p> <p>9.2 Periodicity of Hyperbolic Functions</p> <p>9.3 Relation Between Hyperbolic and Circular Functions</p> <p>9.4 Formulae of Hyperbolic Functions</p> <p>9.5 Separation into Real and Imaginary Parts of Circular and Hyperbolic Functions</p> <p>Logarithm of a Complex Quantity</p> <p>10.1 Logarithm of a Complex Quantity</p> <p>10.2 General and Principal Values of Logarithm of z</p> <p>10.3 Laws of Logarithms for Complex Numbers</p> <p>10.4 The General Exponential Function</p> <p>10.5 General Logarithm Function</p> <p>Examples</p> <p>Problems</p> |
| 22.02.2021-27.02.2021 | <p>Inverse Circular and Inverse Hyperbolic Functions</p> <p>11.1 Inverse Circular Functions of a Real Variable</p> <p>11.2 General Values and Principal Value</p> <p>11.3 Relation Between Inverse Functions</p> <p>11.4 Inverse Circular Functions of a Complex Number</p> <p>11.5 General Values and Principal Value</p> <p>11.6 Inverse Hyperbolic Functions</p> <p>11.7 General Values and Principal Value</p> <p>11.8 Inverse Hyperbolic Functions</p> <p>11.9 Gregory's Series</p> <p>11.10 Another Form of Gregory's Series</p> <p>11.11 General Value</p> <p>Evaluation of π</p> <p>Examples</p> <p>Problems</p> |
| 01.03.2021-06.03.2021 | <p>Summation of Series</p> <p>12.1 Series of Sines and Cosines of Angles Which are in A.P.</p> <p>12.2 Method of Differences</p> <p>12.3 $C+iS$ Method of Summation</p> <p>12.4 Some Standard Results</p> <p>12.5 Series Depending upon The G.P. OR The Binomial Series</p> <p>12.6 Series Depending Upon Exponential, Sine and Cosine Series</p> <p>12.7 Series Depending On Logarithmic Series</p> <p>12.8 Summation of Series Depending On Hyperbolic Series</p> <p>Examples</p> <p>Problems</p> |
| 08.03.2021-13.03.2021 | Revision |
| 15.03.2021-20.03.2021 | Revision |
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Lesson Plan
(Session November 2020 to March 2021)

Name of Teacher: Ms. Aarti Kadian

Class: B.Com.-I

Paper: Business Mathematics

| Date | Topics |
|----------------------|--|
| 16.11.20 to 21.11.20 | Logarithms, some important deduction on Logarithms, properties of Logarithms, quotient formula |
| 23.11.20 to 28.11.20 | Power formula, natural and common Logarithms, anti-logarithm, problems based on above topics. |
| 30.11.20 to 05.12.20 | Sequences, arithmetic progression, sum of n terms of an A.P. arithmetic mean, problems based on arithmetic progression. |
| 07.12.20 to 12.12.20 | Geometric progression, sum of n terms of G.P and infinite terms of G.P., geometric mean, application of A.P. and G.P. |
| 14.12.20 to 19.12.20 | Problems based on G.P., Differentiation, chain rule of differentiation, problems practice. |
| 21.12.20 to 26.12.20 | Differentiation of logarithmic and exponential functions, differentiation of implicit function, logarithmic differentiation. |
| 28.12.20 to 02.01.21 | Problems on above topics. |
| 04.01.21 to 09.01.21 | Local maxima and local minima, first and second derivative test, problems based on above topics. |
| 11.01.21 to 16.01.21 | Some Important definitions and types of matrices, basic operations on matrices, multiplication of matrices and their examples. |
| 18.01.21 to 23.01.21 | Transpose of matrix, determinants and problems based on determinants. |
| 25.01.21 to 30.01.21 | Problems discussion and unit test-1 |
| 01.02.21 to 06.02.21 | Ad joint and inverse of matrix, problems discussion, solution of system of linear equations. |
| 08.02.21 to 13.02.21 | Compound interest: discussion on the problems of compound interest. |
| 15.02.21 to 20.02.21 | Annuities: discussion on types of annuities and some problems. |
| 22.02.21 to 27.02.21 | Present value of an annuity. Some practical problems on annuities. |
| 01.03.21 to 06.03.21 | Revision |
| 08.03.21 to 13.03.21 | Revision |