B.A. / B.Sc. 5th Semester

Lesson plan (Mathematics)

Paper- Groups and Rings

Session 2020-21

September 2020

SECTION-I

Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups, Cosets, Left and right cosets, Index of a sub-group Coset decomposition. Largrage's theorem and its consequences, Normal subgroups, Quotient groups.

October 2020

SECTION-II

Homoomorphisms, isomophisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups, Permutations groups. Even and odd permutations, Alternating groups, Cayley's theorem, Center of a group and derived group of a group.

November 2020

SECTION-III

Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphisms, ideals (principle, prime and Maximal) and Quotient rings, Field of quotients of an integral domain.

December-January 2020 2021

SECTION-IV

Euclidean rings, Polynomial rings, Polynomials over the rational field, The Eisenstein's criterion, Polynomial rings over commutative rings, Unique factorization domain, R unique factorization domain implies so is R[X1 , X2 ……Xn]

Signature of teacher

B.A. / B.Sc. 3rd Semester

Lesson plan (Mathematics)

Paper- Partial Differential Equations

Session 2020-21

August-September 2020

SECTION-I

Partial differential equations: Formation, order and degree. Linear and Non-Linear Partial differential equations of the first order: Complete solution, singular solution, General solution. Solution of Lagrange's linear equations. Charpit's general method of solution. Compatible systems of first order equations. Jacobi's method.

October 2020

SECTION-II

Linear partial differential equations of second and higher orders. Linear and non-linear homogenious and non-homogenious equations with constant co-efficients. Partial differential eqution with variable co-efficients reducible to equations with constant coefficients, their complimentary functions and particular Integrals. Equations reducible to linear equations with constant co-efficients.

November 2021

SECTION-III

Classification of linear partial differential equations of second order. Hyperbolic, parabolic and elliptic types. Reduction of second order linear partial differential equations to Canonical (Normal) forms and their solutions. Solution of linear hyperbolic equations. Monge's method for partial differential equations of second order.

December-January

SECTION-IV

Cauchy's problem for second order partial differential equations. Characteristic equations and characteristic curves of second order partial differential equation. Method of separation of variables: Solution of Laplace's equation. Wave equation (one and two dimensions), Diffusion (Heat) equation (one and two dimension) in Cartesian Co-ordinate system.

Signature of teacher

B.A. / B.Sc. 1st Semester
Lesson plan (Mathematics)
Paper -Algebra
Session 2020-21

November 2020

Section – I

Symmetric, Skew symmetric, Hermitian and skew Hermitian matrices. Elementary Operations on matrices. Rank of a matrices. Inverse of a matrix. Linear dependence and independence of rows and columns of matrices. Row rank and column rank of a matrix. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding the inverse of a matrix.

December 2020

Section – II

Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations. Theorems on consistency of a system of linear equations. Unitary and Orthogonal Matrices. Bilinear and Quadratic forms.

January 2021

Section – III

Relations between the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. Transformation of equations.

February 2021

Section – IV

Nature of the roots of an equation Descarte's rule of signs. Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions.

Signature of teacher

B.A. / B.Sc. 5th Semester

Lesson plan (Mathematics)

Paper -Real Analysis and Numerical Analysis

Session 2020-21

August 2020

SECTION-I

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. Interpolation with unequal intervals: Newton's divided difference. Lagrange's Interpolation formulae. Hermite Formula.

Sept. 2020

SECTION-II

Central Differences: Gauss forward and Gauss's backward interpolation formulae. Sterling, Bessel Formula.

Probability distribution of random variables. Binomial distribution. Poisson's distribution. Normal distribution: Mean. Variance and Fitting.

October 2020

SECTION-III

Numerical Differentiation: Derivative of a function using interpolation formulae as studied in Sections –I & II.

Eigen Value Problems: Power method. Jacobi's method. Given's method. House-Holder's method, QR method, Lanczos method.

November 2020

SECTION-IV

Numerical Integration: Newton-Cote's Quadrature formula, Trapezoidal rule. Simpson's one- third and three-eighth rule. Chebychev formula. Gauss Quadrature formula.

Numerical solution of ordinary differential equations: Single step methods-Picard's method. Taylor's series method, Euler's method. Runge-Kutta Methods. Multiple step methods; Predictor-corrector method, Modified Euler's method. Milne-Simpson's method.

December 2020

SECTION-I

Riemann integral. Integrabililty of continuous and monotonic functions. The Fundamental theorem of integral calculus. Mean value theorems of integral calculus.

January 2021

SECTION-II

Improper integrals and their convergence. Comparison tests, Abel's and Dirichlet's tests. Frullani's integral. Integral as a function of a parameter Continuity, Differentiability and integrability of an integral of a function of a parameter.

Signature of teacher

B.A. / B.Sc. 3rd Semester
Lesson plan (Mathematics)
Paper -Statics
Session 2020-21

SECTION-I

August 2020
Composition and resolution of forces. Parallel forces.

September 2020
Moments and Couples.

SECTION-II

October 2020
Analytical conditions of equilibrium of coplanar forces. Friction.
November 2020
Centre of Gravity.

SECTION-III

December 2020
Forces in three dimensions. Poinsots central axis. Virtual work.

SECTION-IV

January 2021

Null lines and planes. Wrenches. Stable and unstable equilibrium.

Kavita
Signature of teacher

B.A. / B.Sc. 1st Semester

Lesson plan (Mathematics)

Paper -Calculus

Session 2020-21

Nov. 2020

Section – I

$\varepsilon - \delta$ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuities. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

Dec. 2020

Section – II

Asymptotes in Cartesian coordinates. intersection of curve and its asymptotes. asymptotes in polar coordinates. Curvature. radius of curvature for Cartesian curves. parametric curves. polar curves. Newton's method. Radius of curvature for pedal curves. Tangential polar equations. Centre of curvature. Circle of curvature. Chord of curvature. evolutes. Tests for concavity and convexity. Points of inflexion. Multiple points. Cusps. nodes & conjugate points. Type of cusps.

Jan. 2021

Section – III

Tracing of curves in Cartesian. parametric and polar co-ordinates. Reduction formulae. Rectification. intrinsic equations of curve.

Feb. 2021

Section – IV

Quardrature (area)Sectorial area. Area bounded by closed curves. Volumes and surfaces of solids of revolution. Theorems of Pappu's and Guilden.

Books Recommended :

Ravita

Signature of teacher

Lesson Plan 2020-21

Dinesh Kumar
Assistant Professor of Mathematics
CMG, GCW, Bhodia Khera,Fatehabad

Month	Class	Nomenclature	Remarks
Aug	B.COM-1st		
	B.A.-1st		
	B.SC-III	Metric Spaces	
Sep	B.COM-1st		
	B.A.-1st		
	B.SC-III		
Oct	B.COM-1st		
	B.A.-1st		
	B.SC-III	Metric Spaces	
Nov	B.COM-1st	Matrices,Adjoint of a Matrix , Inverse of a Matrix , Applications of Matrices	
	B.A.-1st	General Equation of Second Degree,Tracing of Conics	
	B.SC-III	Open and Closed Sets in Metric Spaces	
Dec	B.COM-1st	Concept of Fuctions and Limits, Concept of Continuity	
	B.A.-1st	System of Conics,Confocal Conics	
	B.SC-III	Completeness in Metric Spaces	
Jan	B.COM-1st	Differentiation,Applications of Differentiation	
	B.A.-1st	Sphere,Cylinder	
	B.SC-III	Continuity and Uniform Continuity in Metric Spaces	
Feb	B.COM-1st	Linear Programming	
	B.A.-1st	The Conicoid	
	B.SC-III	Compactness in Metric Spaces	
March	B.COM-1st	Simple And Compound Interest	
	B.A.-1st	Generating Lines,Reduction of Second Degree Equations	
	B.SC-III	Connectedness in Metric Spaces	

Dinesh

Lesson Plan 2020-21

Dinesh Kumar
Assistant Professor of Mathematics
CMG, GCW, Bhodia Khera,Fatehabad

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Lesson Plan 2020-21

Dinesh Kumar
Assistant Professor of Mathematics
CMG, GCW, Bhodia Khera,Fatehabad

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