Course/Paper Name: **Linear Algebra**

Semester:VI **Total Hours:60**

Sl. No.	Theory	Methodology/pedagogy	Month and Year
1	Unit-1: Vector spaces Vector spaces - Definition, examples and properties; Subspaces - Examples, criterion for a subspace and some properties; Linear Combination -Linear span, Linear dependence and Linear independence, basic properties of linear dependence and independence, techniques of determining linear dependence and independence in various vector spaces and related problems; Basis and dimension - Co-ordinates, ordered basis, some basic properties of basis and dimension and subspaces panned by given set of vectors; Quotient space- theorems.	PPT Slides and white Board	1st and 2nd week of March 2024
2.	Unit-11: Linear Transformations Linear transformation - Definition, examples, equivalent criteria, some basic properties and matrix representation, change of basis and effect on associated matrix, similar matrices; Rank - Nullity theorem - Null space, Range space, proof of rank nullity theorem and related problems.	PPT Slides and white Board	3rd and 4th week of March 2024

3	Unit-111: Polynomial Interpolations Finite differences. Forward, backward and central differences and shift operators: definitions, properties and problems; Polynomial interpolation - Newton-Gregory forward and backward interpolation formulas, Gauss's Forward and backward interpolation formulas. Lagrange interpolation polynomial, Newten's divided differences and Newton's general interpolation formula (Discussion on setting up the polynomials. Differences betireen them and problems on their applications).	PPT Slides and white Board	2nd and 3rd week of April 2024
4	Unit-IV: Numerical Differentiation and Integration Formula for derivatives (till second order) based on Newton-Gregory forward and backward interpolations (Derivations and problems based on them). Numerical Integration- General quadrature formula, Trapezoidal rule, Simpson'sl/Grule, Simpson's 3/8 rule and Weddell's rule (derivations for only general quadrature fornula, trapezoidal rule and Simpson's 1/3rd rule and problems on th eapplications o f all formulas).	Seminar and White Board	2nd and 3rd week of May 2024