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Academic Session:2021-2022 Semester Name:TRIMESTER-II Course Year Name:FY - IX

Subject Name : Linear Algebra and Differential Calculus

Sr No	Unit	Topic Details
1	UNIT-I	Linear and Orthogonal Transformations, Orthogonal Matrix
		Linear dependence and Independence
		Rank using Normal form, System of Linear Equations
		Introduction and Types of Matrices, Rank of Matrix using row echelon form
		Examples of Applications of Matrices
		Examples of Eigenvalue and Eigenvectors of a Matrix,
		Cayley-Hamilton Theorem
		Applications of Matrices; scaling, stretching, reflections, rotation, translation in XY-plane
		Rotation about coordinate axes in three dimensional space.
		Eigenvalue and Eigenvectors of a Matrix
2	UNIT-II	Taylor’s series expansion of a function and related examples.
		Leibnitz’s Theorem and problems
		Examples on nth derivative
		nth derivative of Standard functions
		Maclaurin’s series expansion of a function and related examples
3	UNIT-III	Introduction to functions of several variable, Definition of Partial derivatives of first and second order
		Illustrative examples of Partial Derivatives.
		Miscellaneous Examples
		Total derivatives
		Differentiation of Implicit functions
		Partial derivative of Composite function
		Euler’s Theorem and its deductions for Homogeneous functions
		Examples on variable to be treated as constant
4	UNIT-IV	Jacobian of Implicit functions
		Jacobians, Chain Rule of Jacobian
		Lagrange’s method of undetermined multipliers
		Maxima and Minima of function of two variables
		Approximation using Partial derivatives
		Errors using Partial derivatives
		Functional Dependence using Jacobian