Program	BACHELOR OF TECHNOLOGY (B.Tech)	**Semester - 1**
Type of Course	Basic Science Course	
Prerequisite		
Rationale	-	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
Lecture	Tutorial	Lab	Credit	SEE TH	IAT	SEE P	CCE	
3	1	-	4	70	30	-	50	150

***SEE** - Semester End Examination, **IAT** - Internal Assessment Test, **CCE** - Continues & Comprehensive Evaluation*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**MATRICES** Elementary row operations in matrix, Row echelon and Reduced row echelon forms, Rank by echelon forms, Inverse by Gauss-Jordan method, Solution of system of linear equations by Gauss elimination and Gauss-Jordan methods. Eigen values and Eigen vectors, Cayley-Hamilton theorem (Statement only).	9	20
2	**PARTIAL DIFFERENTIATION** Partial differentiation, Mixed derivative theorem, differentiability, Chain rule, Implicit differentiation, Euler's theorem for homogeneous function, Modified Euler's theorem, Tangent plane and Normal line, Extreme values of function of two variables, Lagrange's methods of undetermined multipliers	9	20
3	**FIRST ORDER DIFFERENTIAL EQUATIONS** Reorientation of differential equation of first order first degree, Exact differential equation and Integrating factors, linear and non-linear differential equation,	5	10
4	**HGHER ORDER DIFFERENTIAL EQUATIONS** Solution of homogenous equations of higher order, Complementary functions, Particular Integrals, Method of variation of parameters, Method of Undetermined Coefficients	6	15
5	**MULTIPLE INTEGRALS** Reorientation of concepts of integrals, Double integrals and Triple integrals, Evaluation techniques, change of order of integration, Change of variable, Evaluation of area and volume.	8	15
6	**VECTOR CALCULUS:** Scalar and vector fields. Gradient, directional, derivative, Curl and Divergence- physical interpretation, Solenoidal and Irrotational Vector fields, Line integrals, Applications to work done by a force and flux, Green's theorem (Statement only)	8	20
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	10	25	35	0	0	0

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Apply the knowledge of linear algebra to solve problem of engineering.
CO2	Compute directional derivative, rate of change and optimum value of functions of several variables.
CO3	Find solution of first order differential equations.
CO4	Apply various methods for solving Higher ordinary differential equations and understand their importance to solve engineering problems.
CO5	Find area and volume by double and triple integration.
CO6	Apply vector calculus in Engineering Applications.

CO PO Mapping

CO	CO - 1	CO - 2	CO - 3	CO - 4	CO - 5	CO - 6
PO - 1	1	1	1	1	1	1
PO - 2	1	1	1	1	1	1
PO - 3	1	1	1	1	1	1
PO - 4	1	1	1	1	1	1
PO - 5	1	1	1	1	1	1
PO - 6	1	1	1	1	1	1
PO - 7	1	1	1	1	1	1
PO - 8	1	1	1	1	1	1
PO - 9	1	1	1	1	1	1
PO - 10	1	1	1	1	1	1
PO - 11	1	1	1	1	1	1