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				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				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, Euler's theorem for homogeneous function, Modified Euler's theorem, Tangent plane and Normal line, Jacobians with properties, Extreme values of function of two variables, Lagrange's methods of undetermined multipliers.	9	20
3	**FIRST ORDINARY DIFFERENTIAL EQUATION** Reorientation of differential equation of first order first degree, Exact differential equation and Integrating factors, linear and reducible to linear differential equation.	5	10
4	**HIGHER ORDINARY DIFFERENTIAL EQUATION:** Solution of homogenous equations of higher order with constant coefficients, Complementary functions, Particular Integrals, Method of variation of parameters, Method of Undetermined Coefficients.	7	15
5	**LAPLACE TRANSFORM** Definition, Existence theorem (Statement only), Basic properties, Laplace transform of derivatives and integrals, Inverse Laplace transform and properties, Convolution Theorem (Statement only), Applications to solve simple linear differential equations.	9	20
6	**FOURIER SERIES AND FOURIER TRANSFORM** Definition, Fourier series with arbitrary period, in particular periodic function with period . Fourier series of even and odd function, Half range Fourier series, Introduction to Fourier transform, Basic properties	6	15
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	7	28	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 the solution of first ordinary differential equations.
CO4	Apply various methods for solving Higher ordinary differential equations and understand their importance to solve engineering problems.
CO5	Acquire the knowledge of the Laplace transform and its application
CO6	Construct the Fourier series and Fourier Transform of periodic functions.

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