Module No.	Unit No.	Details of Topic	Hrs.
1		**Laplace Transform**	10
	1.1	Definition of Laplace Transform, Laplace Transform of *sin(at), cos(at), , sinh(at), cosh(at), erf(t),* Heavi-side unit step, dirac-delta function, Laplace Transform of periodic function	
	1.2	Properties of Laplace Transform (without proof): Linearity, first shifting theorem, second shifting theorem, multiplication by t^n, division by t, Laplace Transform of derivatives and integrals, change of scale.	
	1.3	Inverse Laplace Transform: Partial fraction method, convolution theorem(without proof) ,	
	1.4	Applications of Laplace Transform: Solution of ordinary differential equations with constant coefficients.	
2		**Fourier Series**	09
	2.1	Introduction:Definition, Dirichlet's conditions, Euler's formulae	
	2.2	Fourier Series of Functions:Exponential, trigonometric functions, even and odd functions, half range sine and cosine series Parsevel's identities (without proof)	
	2.3	Complex form of Fourier series , Fourier Transform & Inverse Fourier Transform	
3		**Matrices**	10
	3.1	Characteristic equation, Eigenvalues and Eigenvectors, properties of Eigenvalues and Eigenvectors	
	3.2	Cayley-Hamilton theorem, examples based on verification of Cayley-Hamilton theorem	
	3.3	Similarity of matrices, Diagonalisation of matrix	
	3.4	Functions of square matrix, derogatory and non-derogatory matrices	
4		**Vector Differentiation and Integration**	10
	4.1	Gradient of scalar point function, divergence and curl of vector point function, Solenoidal and irrotational vector fields	
	4.2	Vector Integral: Line integral, Green s theorem in a plane, Gauss divergence theorem, Stokes theorem (without proof), Scalar and vector product of three and four vectors and their properties	
		Total	**39**

Recommended Books:

1.P. N. Wartikar and J. N. Wartikar, *"A Text Book of Applied Mathematic",* Vol. I & II, VidyarthiGrihaPrakashan

2.B.S. Grewal, *"Higher Engineering Mathematics",* Khanna Publication

3. Erwin Kreysizg, *"Advanced Engineering Mathematics",* John Wiley & Sons, Inc